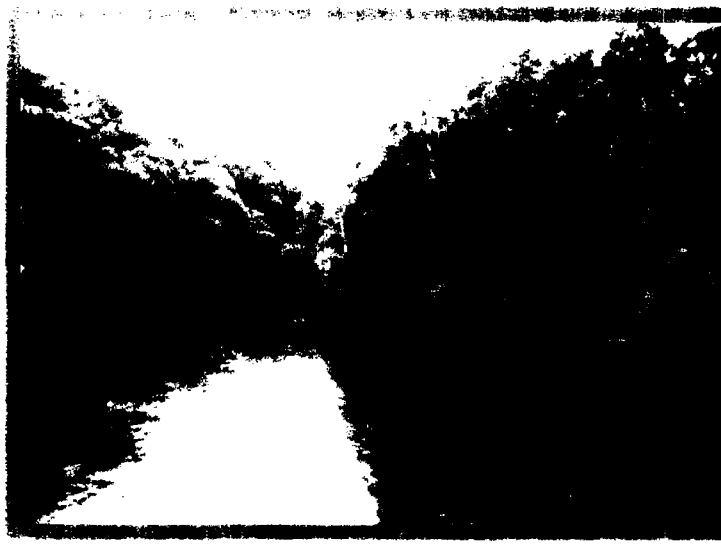
CDM Camp Dresser & McKee

Michigan Department of Environmental Quality

Kalamazoo River and Portage Creek Wetland Delineation Study



January 2002

Report

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Acronyms

API	Allied Paper, Inc.
BBL	Blasland, Bouck & Lee
cfs	cubic feet per second
CDM	Camp Dresser & McKee, Inc.
EPA	U.S. Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GPS	Global Positioning System
KR	Kalamazoo River
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MSL	mean sea level
NI	No indicator
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NTCHS	National Technical Committee for Hydric Soils
NWI	National Wetland Inventory
OBL	Obligate Wetland
PC	Portage Creek
PCB	Polychlorinated Biphenyl
PEM	palustrine emergent wetlands
PFO1C	palustrine forested
PFO	palustrine forested wetlands
PSS	palustrine scrub-shrub wetlands
OU1	Allied Paper, Inc. Site
RI	Remedial Investigation
R20WH	Riverine, lower perennial, open water that is permanently flooded
SCS	Soil Conservation Service
U	Upland
Ug	Upland Soil Classification
UPL	Obligate Upland
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service

Section 1
Introduction and Background

1.1 Introduction

Michigan Department of Environmental Quality (MDEQ) is the state environmental regulatory agency that administers the protection of water quality through standards and regulations. The Environmental Protection Agency (EPA) is the national organization that establishes air and water quality standards and rules to protect the environment through regulations. As part of a risk management process review, the location, extent, and spatial area of wetlands at selected locations along the Kalamazoo River and Portage Creek, Michigan were determined. Camp Dresser & McKee, Inc. (CDM) was tasked by MDEQ to conduct wetland delineations for the purpose of confirming the existing National Wetland Inventory (NWI) maps and delineate wetland boundaries within a portion of the Kalamazoo River and Portage Creek floodplains. **Figures No. 1.1** and **No. 1.2** present the locations in which the wetland delineations were conducted. The results of the wetland delineation study will be used in making risk management and remedial decisions for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (API/PC/KR).

1.2 Background

In 1990, the API/PC/KR Site was placed on the National Priorities List (NPL) due to polychlorinated biphenyl (PCB) contamination from paper mill wastes. PCBs are defined as any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances that contain such substance. The Site includes three miles of Portage Creek, from Cork Street to its confluence with the Kalamazoo River, and 80 miles of the Kalamazoo River, from Morrow Lake dam downstream to Lake Michigan. Also included in the Site are paper residual (i.e., the waste material produced by paper mills during the paper making process) disposal areas and paper mill properties. The paper mills disposal of residuals resulted in releases of PCBs to the environment.

The Kalamazoo River is an alternating series of free flowing sections and impoundments formed by low level dams. Since most of these impoundments are located downstream of the paper mills and landfills, which are the sources of PCBs, they served as natural sinks for PCB-contaminated sediments. In 1970, the Plainwell, Otsego, and Trowbridge dams were removed to their sill levels that lowered the water level and exposed sediments in the floodplain and former impoundment areas. This caused the water

Wetland Area Behind Trowbridge Dam

level to drop along the riverbank and constrict its flow to a confined and channelized area within the current bank. The area outside the bank or remnant floodplain zone receives little or no inundation except during extreme rain events. However, surface water runoff from rain events and snow melts result in surface drainage through the remnant floodplain zone. Some areas within the floodplain

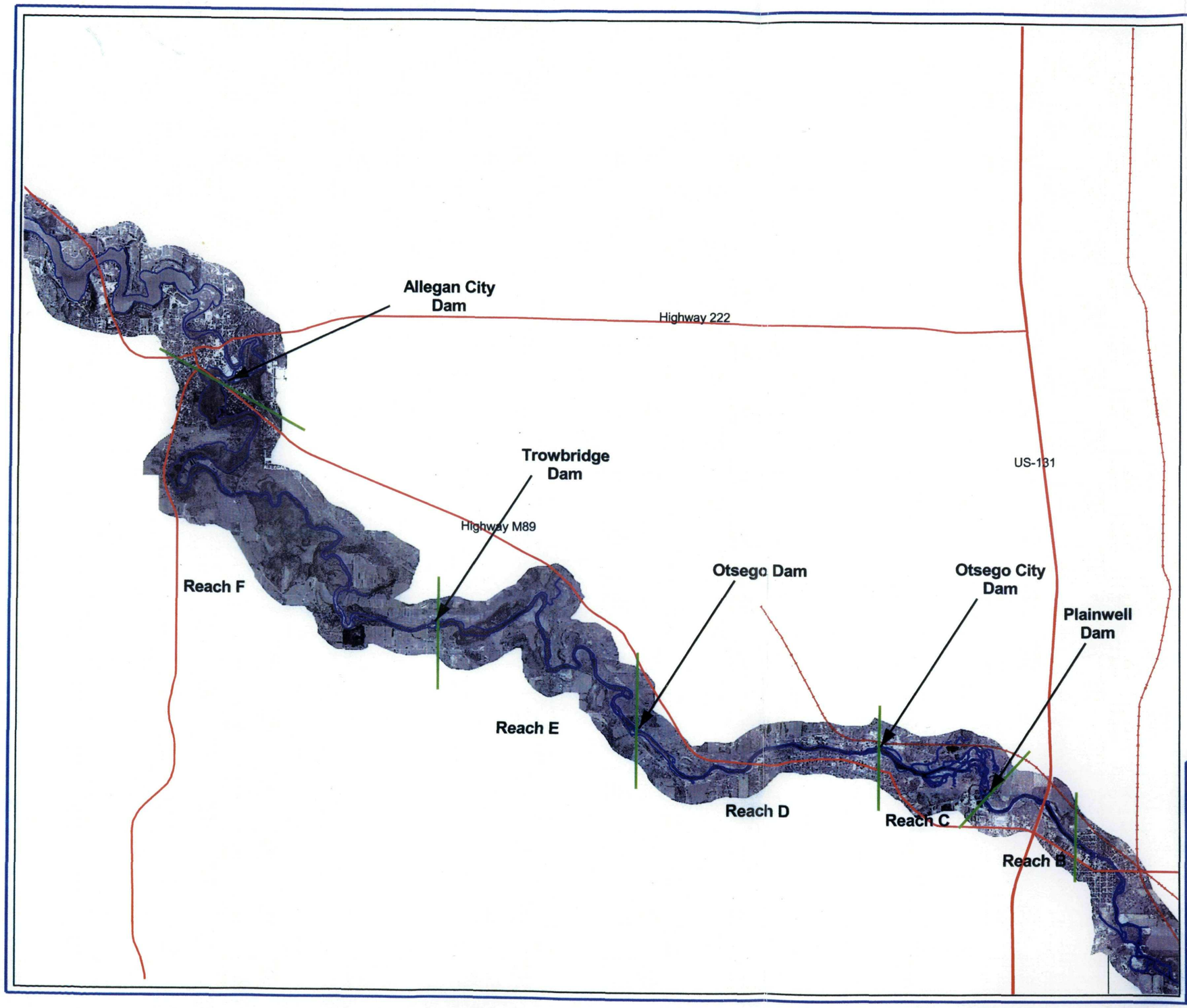
zone periodically support saturated soil conditions during and after a rain event or the spring thaw.

The lowering of these dams has created wetland areas, which were once completely inundated by water. These wetlands support a diversity of vegetation growing on the exposed residual material and provide habitat to terrestrial and semi-aquatic animals (i.e. mink and muskrat).

Tasks for this wetland study include:

- Review existing data, including NWI maps, soils maps, topographic maps, flow/hydrological data, reports, and other documents, prior to conducting field surveys.
- Conduct field surveys to confirm the approximate wetland boundary within the project study area.
- Prepare a wetland study report presenting modified aerial maps. Existing wetland maps prepared by the Michigan Department of Natural Resources (MDNR) were modified to reflect the existing wetland communities found in the study areas.

1.3 Tasks



Wetland Study Area

Legend

- Railroads
- Highways
- River
- Wetland Study Area*

*Wetland Study Area is the area within the 100-year floodplain of the Kalamazoo River and green boundary line indicates reach study areas within each impoundment.

N

Note: Base map derived from Michigan Framework

0 6000 12000 Feet

1:72,000*

On 11" x 17" landscape print-out

CDM

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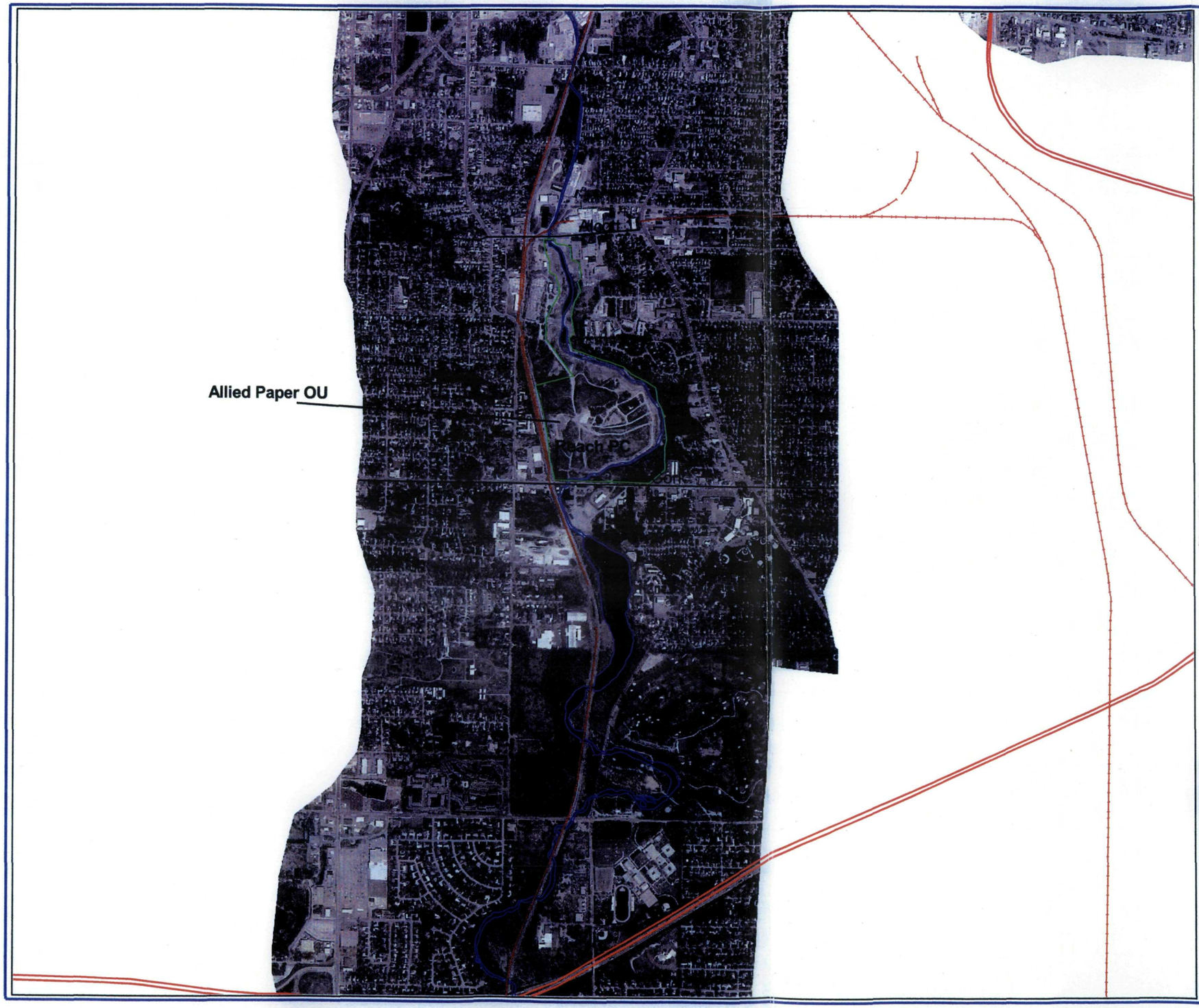
Prepared By:
- J. Harness
Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Wetland Study Area City of Plainwell to Allegan City Dam Impoundment

Figure 1.1



Wetland Study Area

Legend

- Railroads
- Local roads
- Highways
- River
- Wetland Study Area

Note: Base map derived from Michigan Framework

N

0 1000 2000 3000 Feet

1:18,000*

On 11" x 17" landscape print-out

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Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

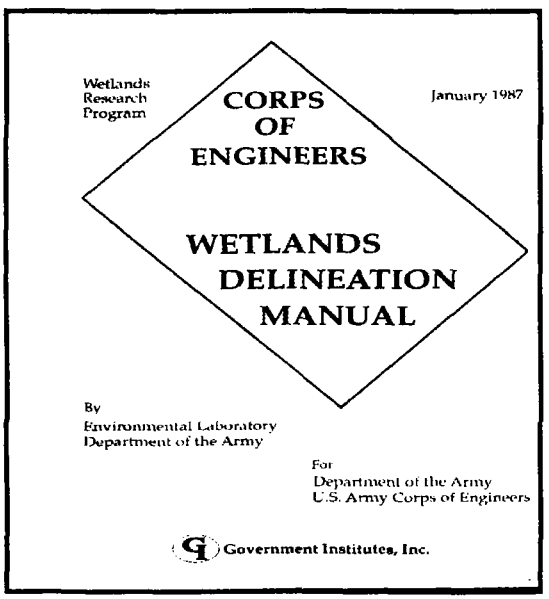
Wetland Study Area Portage Creek

Figure 1.2

Section 2
Wetland Delineation Methodology

2.1 Methodology

Michigan's wetland statute, Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, defines a wetland as "land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh." Identification of wetlands primarily involves the determination of two characteristics: 1) evidence of hydrology and, 2) the predominance of wetland vegetation or aquatic life. In the absence of visual signs of hydrology at the ground surface or under



abnormal circumstances, including drought conditions or recent human disturbance, wetland hydrology can be documented by the presence of hydric soils.

The methods to identify and delineate wetlands were performed in accordance with the U.S. Army Corps of Engineers (USACE) techniques outlined in the USACE *1987 Wetland Delineation Manual* and the MDEQ Draft (March 2001) *MDEQ Wetland Identification Manual: A Technical Manual for Identifying Wetlands in Michigan.* This manual provides field methods for identifying and evaluating site characteristics necessary for concluding whether or not a particular area of land is wetland as defined in Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. In addition, the type of wetland (i.e. emergent, palustrine) was identified according to the classifications published by the U.S. Fish and Wildlife Service (USFWS)(Cowardin et al., 1979).

According to the 1987 USACE manual, wetlands are lands transitional between terrestrial and aquatic systems that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Federal Register 11982, 1980).

The 1987 USACE manual specifies that characteristics and indicators of wetland hydrology, hydric soils and hydrophytic vegetation must all be present for an area to be considered a jurisdictional wetland. Typically, the presence of these three parameters is mandatory for the designation of jurisdictional wetlands. However, if an area has been disturbed resulting in the obliteration of one or more of the wetland parameters, the presence of wetland hydrology and either hydric soils or hydrophytic vegetation usually is sufficient to identify jurisdictional wetlands (USACE, 1987). For the Kalamazoo River Site,

atypical situations dominate, due to historical deposition of waste paper residual materials. A thick layer of gray clay residuals dominate the majority of the soil samples inspected. These residuals are several inches thick to over 30 inches thick, and did not correspond with typical soil characteristics that are found along the Kalamazoo River (USDA 1987 and `1993). The Portage Creek Site was atypical, in that, the riparian habitat was altered to remove contamination along the creek. The riparian habitat area was returned to its original contours and revegetated. Technical criteria for the three parameters described by the USACE manual are summarized in the sections that follow.

2.1.1 Hydrology

The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season (USACE 1987).

Indicators of wetland hydrology may include, but are not limited to: drainage patterns, drift lines, sediment deposition, water marks, stream gage data, visual observation of saturated soils and visual observation of inundation. For saturation to impact vegetation, it must occur within a major portion of the root zone (usually within 12 inches of the surface) of the dominant vegetation.

Part of the study was to determine the extent of wetlands that occur within the defined floodplain. The extent of the flood plain was based on the interpolation of topographic surveys and aerial photographs, in conjunction with wetland maps retrieved from the United Fish and Wildlife Service, National Wetlands Inventory web site (www.nwi.fws.gov). From this information all wetland communities identified between the existing water's edge of the creek or the river and the flood plain were identified and measured using GIS based maps to determine the wetland acreage.

2.1.2 Soils

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) 1985). The SCS has been renamed as the Natural Resource Conservation Service (NRCS).

Indicators used to determine whether hydric soils are present on a site are listed below. Any one of the following indicates that hydric soils are present (listed in order of decreasing reliability):

- Organic soils (Histisols)
- Histic epipedons
- Sulfidic material
- Aquic or peraquic moisture regimes
- Reducing soil conditions
- Soil colors (polychromatic hues and value)
- Soil appears on a hydric soils list (developed by the National Technical Committee for Hydric Soils (National Technical Committee for Hydric Soils) For the USDA SCS (1986). **Table 2-1** presents the list of natural hydric soils that are known to occur along the Kalamazoo River and Portage Creek study areas (USDA-SCS, 1993 and 1987).

Table 2-1 List of Soils Within the Kalamazoo River and Portage Creek Study Areas

Map Symbol	Soil Map Unit	Family or higher taxonomic classes
2	Glendora	Mixed, mesic Mollic Psammaquents
5	Houghton muck	Euic, mesic, Typic Medisaprists
10B & E	Oakville FS	Mixed, mesic, Typic Udipsamments
11B & E	Oshtemo-Chelsea	Coarse-loamy, mixed Typic Hapludalfs
14E	Marlette L	Fine-loamy, mixed mesic Glossoboric Hapludalfs
19A	Brady SL	Coarse-loamy, mixed, mesic Aquollic Hapludalfs
28A	Rimer LS	Loamy, mixed, mesic Aquic Arenic Hapludalfs
29	Cohoctah SIL	Coarse, loamy, mixed, mesic Fluvaquentic Haplaquolls
31B, C, D & E	Tekenink LFS	Coarse-loamy, mixed mesic Glossoboric Hapludalfs
33A	Kibbie FSL	Fine-loamy, mixed, mesic Typic Haplaquolls
39	Granby LS	Sandy, mixed, mesic Typic Haplaquolls
42B	Metamora SL	Fine-loamy, mixed mesic Udollic Ocharaqualfs
44B, D, & E	Chelsea LFS	Mixed, mesic Alfic Udipsamments
49A	Tedrow	Mixed, mesic Aqui Udipsamments
51A	Thedtford	Sandy, mixed mesic Psammaquentic Hapludalfs
57A	Covert S	Sandy, mixed, mesic Entic Haplorthods
62	Sloan	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
73A	Algansee LS	Mixed, mesic Aquic Udipsamments
18	Pits	N/A
50	Aquents & Histisols	Mixed, mesic Aquents

Source: USDA-SCS (NRCS) 1987 and 1993.

Characteristics of soils evaluated in the field were compared to the descriptions of hydric soils to determine if the soils at the sampling point were hydric. General soil associations and soil complexes in Kalamazoo and Allegan Counties are described in the respective county soil surveys (USDA-SCS, 1993; USDA-SCS, 1987).

2.1.3 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (USACE, 1987).

In addition, the definition of wetlands includes the phrase "prevalence of vegetation". Prevalent vegetation is characterized by the dominant species comprising the plant community. The definition of wetlands also includes the phrase "typically adapted".

Typically adapted refers to a species being normally or commonly suited to a given set of environmental conditions, due to some

morphological, physiological, or reproductive adaptation.

Several indicators may be used to determine whether hydrophytic vegetation is present on a site. The most reliable indicator is whether more than 50 percent of the dominant species are obligate wetland (OBL) plants, facultative wetland (FACW) plants, or facultative (FAC) plants. **Table 2-2** lists the definitions for the various plant species indicator categories used.

Table 2-2 Plant Species Indicator Category Definitions

Category	Definition
Obligate Wetland (OBL):	Plants that almost always occur in wetlands (estimated probability>99%).
Facultative Wetland (FACW):	Plants that usually occur in wetlands (estimated probability 67 to 99%), but are occasionally found in non-wetlands areas.
Facultative (FAC): Facultative Upland (FACU):	Plants that is equally likely to occur in wetlands or non-wetlands (estimated probability 35 to 67%).
Obligate Upland (UPL):	Plants that usually occur in non-wetlands (estimated probability 67 to 99%).
	Plants that almost always occur in non-wetlands (estimated probability > 99%) under natural conditions.

Source: Environmental Laboratory 1987)

The indicator status for plant identification in the field was obtained from the National List of Plant Species that Occur in Wetlands Region 3 - North-central (Resource Management Group Inc, Environmental Planners and Consultants, Grand Haven, Michigan, 1999).

Other indicators of hydrophytic vegetation include buttressed tree trunks, hypertrophied lenticels, adventitious roots, shallow root systems, and floating leaves.

2.2 Field Methods

Since the dams were lowered in 1970, physical changes along the river floodplain have resulted in some previous wetland areas now supporting both wetland and upland characteristics. CDM was, therefore, requested by MDEQ to complete a ground survey to delineate the extent of riparian wetlands under current conditions.

The study area was divided into six reaches to be assessed and discussed in this report. The reaches covered are identified as:

- Reach PC - Portage Creek (OU-1 Site)- between Alcott Street and Cork Street,
- Reach B - Kalamazoo River - City of Plainwell to Plainwell Dam,
- Reach C Kalamazoo River - Plainwell Dam to Otsego City Dam in Otsego,
- Reach D - Kalamazoo River -Otsego City Dam to Otsego Dam,
- Reach E - Kalamazoo River - Otsego Dam to Trowbridge Dam, and
- Reach F Kalama zoo River -Trowbridge Dam to Allegan City Dam in Allegan.

Sources of site-related information obtained and reviewed for use in the field included:

- The National Wetlands Inventory (NWI) maps for the Otsego (1981), Merson (1981), Allegan (1981), and Portage (1981) quadrangles, overlayed on black and white aerial photographs (1999) for the 40 mile reach of the river to be surveyed,
- Allegan County Soil Survey aerial maps (1987) and classifications,
- Kalamazoo County Soil Survey maps (1993) and classifications,

- USGS topographic maps for the Otsego, Merson, Allegan, and Portage quadrangles (1981),
- USGS Hydrological Data for the Kalamazoo River,
- List of existing wetland plant indicator species; and
- Related documents (Feasibility Study 1997, Health and Safety Plan 1997, and the Ecological Risk Assessment 1997).

A field survey of the riparian area along the Kalamazoo River and Porter Creek was conducted from June 19, 2001 to July 11, 2001. Three teams of qualified biologists (trained USACE wetland delineators) and engineers conducted field surveys of the river and the former floodplain within the study areas. One team traveled by boat along the river for the entire designated reach. The remaining two teams traversed by foot around and through existing wetland communities on both sides of the river. All wetlands encountered were

Field Delineation Crew

compared to the 1981 NWI maps. If field observations and assessments confirmed the information on the NWI map, no further information was gathered, and the team continued to survey along the river. If field observations of the wetland boundary did not concur with the NWI map (i.e., surveyors located a wetland that was not designated as such on the NWI map or a wetland mapped on the 1981 NWI map was determined not to be a wetland now), then a delineation of the new parcel was conducted according to the USACE methodology. All information collected at these points were recorded on field maps, on field data forms (**Appendix A**), and in field logbooks **(Appendix B)**.

Hand-held Global Positioning System (GPS) equipment (Garmin e-Model) was used to record discrepancies in wetland locations that were identified during the field survey. GPS was used to record and confirm random wetland boundaries sampling points with aerial photographs and NWI maps.

Any changes in the wetland boundary from the NWI maps were noted in the results section of this report. Field teams inspected and identified former floodplain areas that are landward of the existing bank which are vegetated with upland and wetland plant communities, and included hydric soils characteristics in some depressional areas and drained soils in the upland areas.

Section 3
Wetland Delineation Results

3.1 Introduction

The wetland delineation performed along the Kalamazoo River between the cities of Plainwell and Allegan reaches, confirmed that specific wetland areas had changed conditions from the original 1981 NWI map designation. No wetland changes were observed in the Portage Creek - OU1 (Reach PC) wetland delineation area. **Figure 1.1** presents the location of the five river reaches and **Figure 1.2** presents the Portage Creek tributary wetland survey located within OU1. The three-parameter wetland delineation methodology was used to field test and compare NWI maps with confirmed field conditions and noted changes observed in the field. Field observations, hydrology, soil, and vegetation assessments made in the floodplain areas and riparian habitat along Portage Creek tributary study area and the five reaches of the Kalamazoo River are discussed below that include existing conditions, where changes occurred, and wetland status.

The wetland delineation areas include:

- Reach PC – Portage Creek (OU1 site), between Alcott and Cork Streets
- Reach B – Kalamazoo River- City of Plainwell to Plainwell Dam,
- Reach C – Kalamazoo River- Plainwell Dam to Otsego City Dam,
- Reach D – Kalamazoo River- Otsego City Dam to Otsego Dam,
- Reach E – Kalamazoo River- Otsego Dam to Trowbridge Dam, and
- Reach F – Kalamazoo River- Trowbridge Dam to Allegan City Dam.

Table 3-1 is a list of figures represented within the Kalamazoo and Portage Creek wetland delineation area. **Tables 3-2** and **3-3** lists the vegetative species observed within the Kalamazoo River reaches and the Portage Creek site. **Table 3-4** lists the vegetation observed within the garden area along the Kalamazoo River near Otsego Dam, and **Table 3-5** presents the wetland acreage by wetland classification determined for each river reach and the creek tributary. **Appendix A** presents the USACE field forms that provide detailed wetland information for the various sample

Portage Creek

sites along the river and creek systems. Appendix B presents written daily Log Book activity, logistics, and wetland site locations that took place during the wetland study period.

Table 3-1 List of Figures Represented within the Six River Reaches for the Wetland Study Area on the Kalamazoo River and Portage Creek

Reach	NWI/Aerial Photo	Infrared Images vs. NWI	Soils
PC	3.2.1	C.1*	3.2.2
B	3.3.1.	C.2*	3.3.2
C	3.4.1	C.3*	3.4.2
D	3.5.1 and 3.5.2	C.4* and C.5*	3.5.3
E	3.6.1 and 3.6.2	C.6* and C.7*	3.6.3 and 3.6.4
F	3.7.1, 3.7.2 and 3.7.3	C.8*, C.9*, and C.10*	3.7.4 and 3.7.5

*Note: Infrared vs. NWI are presented in Appendix C

Table 3-2 List of Vegetation Observed along the Kalamazoo River Study Area, 2001

Scientific Name	Common Name	USACE Indicator	Scientific Name	Common Name	USACE Indicator
Trees			**Herbaceous**		
Acer rubrum L	Red maple	FAC	*Achillea millefolium*	Yarrow	FACU
Acer negundo L.	Box elder	FACW	*Alliaria officinalis*	Garlic mustard	FAC
Acer saccharum Marsh	Sugar maple	FACW	*Anemone Canadensis*	Canada anemone	FACW
Acer saccharinum L.	Silver maple	FACW	*Articum lappa*	Burdock	UPL
Carpinus caroliniana	Beech, Blue	FAC	*Berteroa incana*	Hoary alyssum	NI
Catalpa speciosa	Catapa	FACU	*Bromjus inermis*	Smooth brome	NI
Cornus amomum	Silky dogwood	FACW+	*Carex crinita*	Fringed sedge	FACW+
Cornus stolonifera	Red oster dogwood	FACW	*Carex vulpinoidea*	Fox seed	OBL
Crataegus crus-galli	Hawthorne	FAC	*Centaurea spp.*	Knapweed	UPL
Fagus grandifolia	American beech	FACU	*Circaea quadrisulcata*	Enceranter's nightshade	UPL
Fraxinus pennsylvanica	Green ash	FACW	*Dauscus carota*	Wild carrot	NI
Gleditsia triacanthos	Honey locust	FACE	*Equisetum aruense*	Horsetail	FACW-
Quercus alba L.	White oak	FACU	*Erigeron annuus*	Daisy fleabane	FAC-
Quercus rubra L.	Red oak	FACU	*Galium aparine*	Cleavers	FACU
Pinus strobes L.	White pine	UPL	*Geranium maculatum*	wild geranium	FACU
Platanus occidentalis L.	Sycamore	FACW	*Hypericum perforatum*	St. John's wort	NI
Populus deltoides Marsh	Cottonwood	FAC+	*Impatiens pallida*	Jewelweed	FACW
Prunus virginiana L.	Choke Cherry	FAC-	*Iris versicolor*	Iris	OBL
Salix amygdaloides	Peachleaf willow	FACW	*Juncus effuses*	Softrush	OBL
Salix babylonia	Weeping willow	FACW	*Lythrum salicaria*	Purple loosestrife	OBL
Salix nigra	Black willow	OBL	*Medicago lupina*	Black medic	FAC-
Ulmus americana L.	American elm	FACW-	*Melilotus alba*	White sweet clover	FACU
Ulmus rubra L.	Slippery elm	FAC	*Menispermum canadense*	Moonseed	FAC*
			Nepeta cataria	Catnip	FAC-
Shrubs					
Asimina triloba (L)	Paw paw	FAC	*Onoclea sensibilis*	Sensitive fern	FACW
Cephalanthus occidentalis	Buttonbush	OBL	*Phalaris arundinaceae*	Reed canary grass	FACW+
Elaeagnus angustifolia	Russian olive	FACU-	*Phytolacca americana*	Pokeweed	FAC-
Ligustrum vulgare	Privet	FAC-	*Plantgo lanceolata*	English plantain	FAC

Table 3-2 List of Vegetation Observed along the Kalamazoo River Study Area, 2001

Scientific Name	Common Name	USACE Indicator	Scientific Name	Common Name	USACE Indicator
Shrubs	*(continued)*		**Herbaceous**	*(continued)*	
Rhus typhina	Staghorn sumac	UPL	*Poa palustris*	Fowl bluegrass	FACW+
Rosa multiflora	Rose		*Podophyllum peltatum*	Mayapple	FACU
Rosa palustris	Swamp Rose	OBL	*Polygonatum canliculatum*	Great Solomon's seal	FACU
Sambucus Canadensis	Elderberry	FACW-	*Potentilla recta*	Roughfruited cinquefoil	NI
Sassafras albidum	Sassafras	FACU	*Ranunuculus hispidus*	Bristly butter-cup	FAC
Symphoriocarpus orbiculatus	Coralberry	FACU	*Rubus allegheniensis*	Highbush Blackberry	FACU+
Toxicodenndron vernix	Poison sumac	OBL	*Rudbeckia laciniata*	Green-headed coneflower	FACW+
Viburnum lentago	Nannyberry	FAC+	*Sanicula canadenis*	Canadian black snakeroot	FACU+
Zanthoxylum americanum	Prickly ash	NI	*Saponaria officinalis*	Bouncing bet	FACU
			Solanum dulcamara	Nightshade	FAC
Vines					
Loncinera xylosteum	European honeysuckle	UPL	*Solidago caesia*	Wreath goldenrod	FACU
			Symplocarpus foetidus	Skunk cabbage	OBL
Parthenocissus quinquefolia	Virginia creeper	FAC-	*Thalictrum polgamum*	Rue Tall Meadow	NI
Toxicodendron radicans	Poison ivy	FAC+	*Typha angustifolia*	Narrow-leaved cattail	OBL
Vitis labrusca	Fox grape	FACU	*Urtica dioica*	Stinging nettle	FAC+
Vitis riparia	Wild grape	FACW-	*Viola pennsylvanica*	Smooth yellow violet	FACW-

Table 3-3 List of Vegetation Observed along the Portage Creek Study Area, 2001

Scientific Name	Common Name	USACE Indicator	Scientific Name	Common Name	USACE Indicator
Trees			**Herbaceous**		
Acer rubrum L	Red maple	FAC	*Achillea millefolium*	Yarrow	FACU
Acer negundo L.	Box elder	FACW	*Alliaria officinalis*	Garlic mustard	FAC
Acer saccharinum L.	Silver maple	FACW	*Alopecurus sp.*	Foxtail	FACW
Carpinus caroliniana	Beech, Blue	FAC	*Ambrosia aetemsiifolia*	Annual Ragweed	FACU
Catalpa speciosa	Catapa	FACU	*Anemone Canadensis*	Canada anemone	FACW
Cornus stolonifera	Red oster dogwood	FACW	*Apocynum cannabinum L.*	Hemp dogbane	FAC-
Fagus grandifolia	American beech	FACU	*Bromus inermis*	Smooth brome	NI
Fraxinus pennsylvanica	Green ash	FACW	*Carex lacustris*	Ladebank sedge	OBL
Gleditsia tricanthos	Honey locust	FAC	*Carex vulpinoidea*	Fox sedge	OBL
Platanus occidentalis	Am. Sycamore	FACW	*Daucus carota*	Wild carrot	NI
Populus deltiodes Marsh	Cottonwood	FAC+	*Erigeron annuus*	Daisy fleabane	FAC-
Prunus virginiana L.	Choke Cherry	FAC-	*Galium aparine*	Cleavers	FACU
Salix nigra	Black willow	OBL	*Geranim maculatum*	Purple Crane's bill	FACU
Ulmus rubra L.	Red elm	FAC	*Iris versicolor*	Iris	OBL
			Juncus effusus	Softrush	OBL
Shrubs					
Cephalanthus occidentalis	Buttonbush	OBL	*Lythrum salicaria*	Purple loosestrife	OBL
Elaeagnus angustifolia	Russian Olive	FACU-	*Medicago lupina*	Black medic	FAC-
Ligustrum vulgare	Privet	FAC-	*Melilotus alba*	White sweet clover	FACU
Rhus typhina	Staghorn sumac	UPL	*Nepeta cataria*	Catnip	FAC-
Rosa mulitflora	Rose	FACU	*Phalaris arundinaceae*	Reed canary grass	FACW+
Sambusus Canadensis	Elderberry	FACW-	*Phytolacca americana*	Pokeweed	FAC-
Symphoriocarpus orbiculatus	Coralberry	FACU	*Plantgo lanceolata*	English plantain	FAC
Saponaria officinalis	Bouncing bet	FACU	*Poa compressa*	Canadian bluegrass	FACU+
Solidago caesia	Wreath goldenrod	FACU	*Potenilla recta*	Roughfruited cinquefoil	NI
			Ranunuculus hispidus	Bristly butter-cup	FAC
Vines					
Lonicera xylosteum	European honeysuckle	UPL	*Rubus allegheniensis*	Highbush Blackberry	FACU+
Parthenocissus quinquefolia	Virginia creeper	FAC-	*Rumex crispus*	Curly dock	FAC+
Toxicondendron radicans	Poison Ivy	FAC+	*Sanicula canadenis*	Canadian black snakeroot	FACU+
Vitus labrusca	Northern fox grape	FACU	*Typha angustfolia*	Cattail	OBL

Table 3-4 List of Vegetation Observed in the vegetable garden area along the Kalamazoo River

Scientific Name	Common Name	USACE Indicator
Trees		
Acer rubrum L.	Red maple	FAC
Acer negundo L.	Box elder	FACW
Populus deltiodes Marsh	*Cottonwood*	*FAC+*
Shrubs		
Rosa multiflora	Rose	FACU
Sambucus Canadensis	Elderberry	FACW-
Vines		
Lonicera xylosteum	European honeysuckle	UPL
Parthenocissus quinquefolia	Virginia creeper	FAC-
Toxicodendron radicans	Poison ivy	FAC+
Vitus labrusca	Northern fox grape	FACU
Herbaceous		
Achillea millefolium	Yarrow	FACU
Ambrosia artemisiifolia	Annual ragweed	FACU
Ambrosia trifida	Great ragweed	FACU
Arcticum lappa	Burdock	UPL
Centaurea spp.	Knapweed	UPL
Circaea quadrisulcata	Enchanter's nightshade	UPL
Daucus carota	Wild carrot	NI
Erigeron annuus	Daisy fleabane	FAC-
Geranium maculatum	Wild Geranium	FACU
Medicago lupina	Black medic	FAC-
Melilotus alba	White sweet clover	FACU
Phalaris arundinaceae	Reed canary grass	FACW+
Phytolacca americana	Pokeweed	FAC-
Plantgo lanceolata	English plantain	FAC
Portulacca oleracea	Common purslane	FAC-
Ranunuculus hispidus	Bristly butter-cup	FAC
Rubus allegheniensis	Highbush Blackberry	FACU+
Solidago caesia	Wreath goldenrod	FACU
Urtica diocia	Stinging nettle	FAC+

Table 3-5 Area of Wetlands Within the CDM-defined Floodplain of the Wetland Study Area

Wetland Type	Wetland Area By Reach (Acres)					
	PC	B	C	D	E	F
Aquatic Bed	0	0	0	0	0	1.2
Emergent	15.2	0.9	110.2	36.8	255.5	58.1
Forested	0	4.6	108.9	12.3	32.8	590.1
Open Water/Unknown Bottom	0	0	0	0	0	15.6
Scrub-Shrub	2.5	0	20.8	0	14.2	49.3
Unconsolidated Bottom	0	37.5	146.8	81.7	183.0	252.4
Unconsolidated Shore	0	0	0	0.7	0	23.1
Uplands	71.5	64.4	111.0	87.5	49.7	177.9

3.2 Reach PC - Portage Creek (OU1 Site)

3.2.1 Field Observations

The one mile long wetland delineation area is located within the OU1 site along the Portage Creek. **Figure 1.2** presents the wetland delineation areas shown between Cork Street at the south boundary of OU1, where the creek enters the site and outfalls at Alcott Street on the north side of the OU1 Site. The northern half of Portage Creek bank and riparian area consist of emergent vegetation (PEM) and palustrine shrub-scrub (PSS). The southern half of the creek has a vertical steel sheet pile on the west bank. The east bank consists of a narrow band of emergent vegetation with the bank rising sharply to an upland forest community. The creek channel is incised at the south end and flattens out into a 100-foot wide floodplain, about 600 feet downstream from where the creek enters the site. Three small isolated wetlands shrub-scrub (PSS) areas are located within the interior of the OU1 site. Infrared images overlayed on NWI figures for all river reaches and the Portage Creek site are presented in **Appendix C**. The creek's physical features are presented in the photographs of the creek in **Appendix D** (photograph Nos. 1 to 6). Wetland acreage for Reach PC included 15.2 acres of palustrine emergent (PEM), and 2.5 acres of palustrine shrub-scrub (PSS). Four GPS waypoints were taken to confirm the NWI wetland boundary within the wetland delineation areas, as presented in **Figure 3.2.1**

A significant portion of the vegetative community along Portage Creek in OU1 was altered due to the remedial response activities that took place in

Portage Creek flowing north- Allied Paper OU1

1999. PCB contaminated sediments were removed from the creek and associated floodplain and placed on adjacent landfill. After excavation of the contaminated sediments, the creek

channel was restored and revegetated by the United State Fish and Wildlife Service. This revegetation included planting of cottonwoods (*Populus sp.*), willows (*Salix sp.*) , dogwoods (*Cornus sp*) and seeding of herbaceous plants. Prior to excavation, the dominant plant community consisted of purple loosestrife (Lythrum salicaraia), a European plant introduced to the United States. This plant is an aggressive species and tends to crowd out native wetland plants that are valuable to wildlife.

Figure 3.2.1 presents the NWI map data over the aerial photograph. **Figure 3.2.2** presents the soil map used to compare existing conditions with the map designations. The infrared images and the NWI boundary are presented in **Appendix C** as **Figure C.1.** Results of the wetland delineation at the Portage Creek OU1 site indicate that the existing NWI map is accurate, and no changes were made to the original NWI map.

3.2.2 Hydrology

The main drainage pattern for Portage Creek is confined to a shallow winding channel within the Portage Creek (OU1 Site) wetland delineation area. Hydrological indicators for the south end of the study area include lichen lines at the base of *Salix caroliniana* (Carolina Willow) and *Populus deltiodes* (cottonwood) trees. A staff gage with stain lines also at this location indicated where the approximate seasonal high water line occurs. The riparian habitat and flood plain at the north end of the site showed evidence of drainage patterns and saturated soil conditions along the bank. Other indicators include crawfish chimneys and stain lines at the outfall structure that indicate where the seasonal high water line occurs. Hydrological indicators are not present at the upland edge of the creek bank where it rises sharply. This information confirms the hydrological parameter portion of where the wetland delineation line is located within the Portage Creek (OU1) wetland delineation area.

3.2.3 Soils

Appendix A presents the field data forms that include the soil results for the four sampling points (Porl1, Porl2, Porl3, and Porl4). Hydric soil characteristics are present along both sides of the bank and floodplain of Portage Creek study area where surface water inundated the floodplain during part of the growing season. The soil classification of Urban land-Glendora complex (Ug) consists of very poorly drained soils and is listed as hydric soils. **Figure 3.2.2** presents the soil map of Portage Creek OU1 site. At the time of the field inspection soils were dry to moist to a depth of 12 inches or more.

Soil characteristics consist of black sandy loamy and muck soils within 10 inches of the existing ground surface. The soils are saturated enough during part of the year to allow hydrophytic plants to grow and dominate the riparian area, as evident by the mottling. Matrix colors near the surface include confirmed hydric soil characteristics. The soils below the surface contained a light brownish gray color (10YR 6/2) typical of hydric soils. Based on the assessed hydric soil indicators present confirmed that the

existing wetland boundary met the hydric soil criteria at the OU1 wetland delineation areas.

3.2.4 Vegetation

The OU1 wetland systems are classified as palustrine shrub-scrub (PSS), and palustrine emergent (PEM). Upland areas are coded with a symbol (U) and classified as upland. The south end of the study area has an incised steep channel bank of hardwood trees. Three small isolated wetlands within the OU1 wetland delineation area are dominated by *Typha angustifolia* (cattail) and willow and are classified as PSS. **Table 3-3** presents a list of vegetation observed along the Portage Creek wetland delineation area. **Appendix A** presents a detailed list of plants, hydric soil conditions, and hydrological characteristics for the Portage Creek OU1.

Appendix D presents photographs of the site that depict the emergent plant community and forest community along the bank. The dominant emergent plant community at the Portage Creek study area consists of *Juncus effuses* (soft rush), *Pharlaris arundaria* (canary grass), and *Lythrum salicaria* (loosestrife). A narrow stand of hardwood wetland trees dominant the steeply incised bank at the south end of the Portage Creek study area. Dominant trees include *Salix nigra* (Carolina willow), *Acer negundo* (box elder), *Populus deltiodes* (cottonwood), and *Fagus grandifloia* (American beech). The north end has box elder and cottonwood seedlings and saplings in the floodplain. The hydrophytic plant community along the bank met the third criteria to be considered a wetland.

3.3 Reach B – City of Plainwell to Plainwell Dam

3.3.1 Field Observations

Reach B study area extends about 1.5 miles along the Kalamazoo River from the Plainwell Dam and east 1200 feet upstream of Highway 131. This is the majority of the former Plainwell impoundment area (**Figure 3.3.1**). Wetland acreage for Reach B included 0.9 acres of PEM, 4.6 acres of palustrine-forested vegetation (PFO), and 37.5 acres of unconsolidated bottom (UB). **Table 3-5** lists the individual reaches and the area of wetlands by community type that are located within the CDM defined floodplain.

Plainwell Dam on the Kalamazoo River

Two areas within Reach B changed classification status and the wetland boundary. One area was changed from a wetland to an upland area. The second area was an upland now reclassified as a wetland. The classification changes are reflected in the revised wetland boundary shown on **Figure 3.3.1**. The infrared images

and the NWI boundary are presented in Appendix C as **Figure C.2**.

Results of the wetland delineation study within Reach B area indicate that the existing NWI map is accurate, except in two locations. A newly identified palustrine emergent wetland area was not indicated as a wetland on the 1981 NWI map. The palustrine emergent wetland is located approximately 1000 feet upstream of the Plainwell Dam on the north bank. **Figure 3.3.1** presents the five GPS way station identification points (Prb2, Prl1, Prl2, Prl 4, and Prl5). The second area, originally determined to be a palustrine forest, is located on the north bank approximately 2000 feet upstream from the Plainwell Dam. This "palustrine forest" was investigated and found not to possess the hydrology and soil characteristics of a wetland. This isolated forested area was above the flood plain elevation and contained no gray residual material. This area was removed from the map and no GPS points were taken. The area is immediately east of the power lines that cross the river on the north bank.

3.3.2 Hydrology

The Reach B study area, downstream from the City of Plainwell to the Plainwell Dam has well defined banks that are steep and high along the north side of the bank, except one low area. This riparian habitat has low enough elevation to receive floodwaters during the snow melt and inundations during high water. The floodplain area is inundated long enough throughout the growing season to maintain saturated soil conditions. In addition, agricultural lands located on the upland edge of the bank provides runoff that enters into the riparian habitat from higher elevations. Hydrological indicators include saturated soils within the upper 12-inches of the surface. Similar areas with no saturated soils (in the upper 12-inches) were not considered meeting the hydrological indicator that contained the same type soil characteristics.

3.3.3 Soils

Three soil classifications occur within the Reach B wetland delineation area; they include Glendora loamy sand (2), Aquents and Histosols, ponded (50), and Sloan silt loam (62), as presented on **Figure 3.3.2**. Glendora is poorly drained soil. Aquents and Histosols, ponded are very poorly drained soils on the floodplain of the Kalamazoo River where escarpments adjoin the uplands. Sloan silt loam is very poorly drained soils that occur on floodplains. All three are listed as hydric soils by the Natural Resource Conservation Service (NRCS).

A portion of the former Plainwell Dam impoundment area now lies above the existing water line, especially in the riparian habitat. These exposed areas are covered with historically deposited sediments and paper waste residual material, and have since revegetated. Soils within the reach contain gray paper waste residual within the upper 12 to 24 inches. Some of the upland soils have residual material, but lack hydric indicators (dry below 12 inches from the surface) and have aerobic soil characteristics as indicators of upland conditions. This information is

recorded on the USACE field forms, provided in **Appendix A**. Soils tested within the wetland delineation area of Reach B reflect wetlands boundaries accurate except for the two changes.

3.3.4 Vegetation

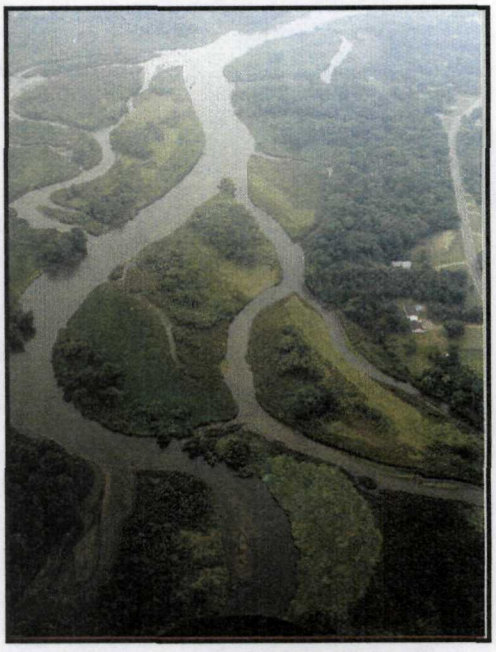
Reach B of the river contained both palustrine emergent communities and palustrine forest communities . Dominant herbaceous vegetation included the canary grass (*Phragmites sp.*) and *Urtica dioica* (stinging nettles). The dominant trees included box elder and *Gleditsia tricanthos* (honey locust). **Table 3-2** presents the list of plants that occur within the Kalamazoo River study area. **Appendix A** presents the field data forms with a detailed list of plants, hydric soils conditions, and hydrological characteristics for Reach B wetland delineation area. **Figure C.2** of **Appendix C** presents the infrared image of the wetland boundary for Reach B.

3.4 Reach C - Plainwell Dam to Otsego City Dam

3.4.1 Field Observations

The 1.7 miles of the Kalamazoo River from Plainwell Dam to Otsego City Dam covers four wetland community types with a broad riparian habitat area between the two impoundments (**Figure 3.4.1**). This area includes 110.2 acres of palustrine emergent, 108.9 acres of palustrine forested wetlands, 20.8 acres of palustrine shrub-scrub wetland, and 146.8 acres of unconsolidated bottom wetlands. **Table 3-5** lists the individual reaches and the acreage of wetlands by community type that are located within the CDM defined floodplain. Gun Creek enters Reach C along the north bank of the Kalamazoo River.

Results of the wetland delineation at the Plainwell Dam to Otsego City Dam area indicate that the existing NWI is accurate. No changes were made in Reach C. Existing wetland boundaries were confirmed with seventeen GPS locations. The wetlands surrounding the 12th Street Landfill were also examined and found to match the delineations on the NWI map.



Kalamazoo River behind Otsego Dam

3.4.2 Hydrology

The Otsego City Dam impoundment retains surface water below the sill level. Historic water levels were 10 to 20-feet higher and retained a broader floodplain area, but are now within the current bank. Most of the area landward of the riparian habitat extends upward sharply confining the wetland boundary. Hydrological

indicators for Reach C include saturated soils and areas of inundation during the growing season. Trees along the bank are marked with seasonal high water stain lines at the base of trees, and drift lines are present within the floodplain. The hydrological characteristics around the 12th Street Landfill included freestanding water up to the base of the landfill. These hydrological indicators for this reach provide sufficient evidence to support the existing wetland boundaries.

3.4.3 Soils

Figure 3.4.2 presents the soil map of the area in Reach C. The infrared images and the NWI boundary are presented in Appendix C as **Figure C.3**. **Figure 3.4.1** presents the NWI map reflecting the wetland boundary as field examined and GPS surveyed.

A portion of Reach C area now lies exposed above the existing water line., especially along the riverbank. Similar to Reach B, these exposed areas are covered with historically deposited sediments and waste residual material, and have since revegetated. Soils within the reach contain gray paper waste residual within the upper 12-inches. Soils at the higher elevations in the floodplain lack hydric characteristics and are more indicative of upland conditions. This information is recorded on the USACE field forms, provided in Appendix A.

Hydric soils located within Reach C study area include Glendora loamy sand, Arents and Histosols. Soils tested within the wetland delineation area confirm the wetland boundary as accurate according to the NWI map.

3.4.4 Vegetation

An upland hardwood forest borders Reach C riparian habitat. Vegetative plant communities within the riparian habitat floodplain include , shrub-scrub communities (PSS) and forested wetlands (PFO). The vegetative community south of the and west of the 12th Street Landfill is dominated by cattails. Table 3-2 presents the list of vegetation observed along the Kalamazoo River study area.

Appendix A presents a list of plants that dominate Reach C. Appendix D presents photographs of the site that depict the emergent plant community along the bank. The dominant herbaceous plant community at Reach C Study Area consists of canary grass, stinging nettle (*Urtica dioica*), cattail, and purple loosestrife. The purple loosestrife is more dominant in the middle channels and on the north side of the river. Dominant trees include Carolina willow, box elder (*Acer negundo*)*Ulmus Americana* (American elm), and American beech (*Ulmus americana*). The hydrophytic plant community along the bank and riparian habitat met the vegetation criteria to be considered a wetland.

3.5 Reach D - Otsego City Dam to Otsego Dam

3.5.1 Field Observations

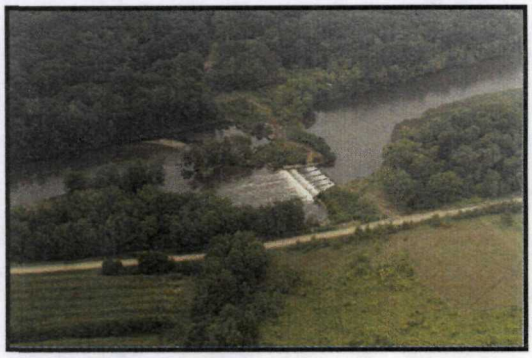
The distance from the Otsego City Dam downstream to the Otsego Dam is approximately 3.4 miles and covers four wetland community types with a narrow riparian habitat area between

the two impoundments (**Figures 3.5.1** and **3.5.2**). This area includes 36.8-acres of palustrine emergent, 12.3-acres of palustrine-forested wetlands, 81.7-acres of unconsolidated bottom wetlands, and 0.7-acres of unconsolidated shore. Table 3-5 lists the individual reaches and the acreage of wetlands by community type that are located within the CDM defined floodplain. **Figures 3.5.1** and **3.5.2** present the NWI/Aerial map overlay for Reach D that were used to confirm existing wetland boundaries with potential changes different from the maps. The infrared images and the NWI boundary are presented in **Appendix C** as **Figures C.4** and **C.5**.

Four areas were noted as wetlands to be added during the field survey. These areas were not identified on the 1981 NWI maps. The first herbaceous emergent wetland (PEM) is located on the south bank of the Kalamazoo River, just north of the Highway M 89 Bridge (GPS waypoint Plc1 in **Figure 3.6.2**). The second wetland (PFO) area is on the north side of the river, just west of the M 89 Bridge (no GPS taken). The third wetland (PEM) is on the south side of the river and immediately west of the public boat ramp on Jefferson Street (GPS waypoint Oc1b in **Figure 3.5.2**). The fourth wetland (PFO) is on the south side of the river upstream of the Otsego Dam (GPS waypoints Pr19 and Prl10).

3.5.2 Hydrology

The Reach D study area has a well-defined channel bank with a narrow floodplain. Drainage from Pine Creek discharges into the Kalamazoo River near the middle of the former Otsego Impoundment. Also, two small un-named tributaries enter the Kalamazoo River from the south bank that provides hydrological conditions to a forested wetland along the floodplain. The Otsego impoundment has been drawn down, which exposes the



Otsego Dam on the Kalamazoo River

historically deposited sediments and residual waste material within the river and floodplain. The floodplain now has re-vegetated with emergent herbaceous species and scrub-shrub plants.

This riparian habitat has low enough elevation to receive floodwaters during the snow melt or significant precipitation events. As a result, the forested and shrub-scrub communities are inundated long enough throughout the growing season to maintain saturated soil conditions. Hydrological indicators include saturated soils within the upper 12-inches of the surface. Similar areas with no saturated soils within the upper 12-inches were not considered meeting the hydrological indicator that contained the same type soil characteristics. Based on this information four new areas within the riparian habitat are considered having

strong hydrological indicators to be a wetland.

3.5.3 Soils

Figure 3.5.3 presents the soil map of the areas in Reach D. Three soil classifications occur within Reach D Study Area. They include Tekenink loamy fine sand , Aquents and Histosols, ponded , and Sloan silt loam. All three soils are listed as hydric soil by NRCS (1991) (see **Table 2-1**).

A portion of Reach D floodplain area also lies exposed above the existing water line., especially along the river bank. These exposed areas are covered with historically-deposited sediments and paper waste residual material. These floodplain areas have re-vegetated. Residual material at the higher elevations lack hydric indicators that have aerobic soil characteristics as indicators of upland conditions. This information is recorded on the USACE field forms, provided in **Appendix A**. Soils tested within the wetland delineation area confirm the wetland boundary appears to be accurate with the NWI map, except at four added wetlands (Plc1, Oclb3, PrlT, Prl9, and Prl10). The four additional wetland sites were added to **Figures 3.5.1** and **3.5.2**. The soils at these locations were inundated or saturated to the surface at the time of the study. The tributary was mapped (PrlT) where it extended through an upland pine island. Soils on the pine island were non-hydric. Soils on the pine island were saturated to the surface or were inundated. Using the Munsel color chart, the color of the soil at the surface was dark brown (10YR 4/3).

3.5.4 Vegetation

Reach D vegetative community consists of palustrine-emergent, palustrine scrub/shrub, and palustrine forested communities on both sides of the bank.

Four new areas were noted as wetlands during the field survey, but not reflected on the 1981 NWI maps. The first herbaceous emergent wetland (PEM) is located on the south bank of the Kalamazoo River, just north of the Highway M 89 Bridge (GPS waypoint Plc1 in **Figure 3.6.2**). Dominant herbaceous plant community at this site consisted of canary grass, *Symplocarpus foetidus* (skunk cabbage), and stinging nettle. The second wetland (PFO) area is on the north side of the river, just west of the M 89 Bridge (no GPS taken). Dominant tree vegetation consisted of box elder and *Plantanus occidentalis* (Sycamore). Groundcover was dominated with *Thalictrum polygamum* (tall meadow rue), *Solidago caesia* (wreath goldenrod), and *Parthenocissus quinquefolia* (Virginia creeper). The third wetland (PEM) is on the south side of the river and immediately west of the public boat ramp on Jefferson Street (GPS waypoint Plc1 in **Figure 3.6.2**). Dominant herbaceous plants include canary grass and cattail. The fourth wetland (PFO) is on the south side of the river upstream of the Otsego Dam (GPS waypoints Pr19 and Prl10). Dominant trees include box elder, *Acer rubrum* (red maple), American elm, and black willow (*Salix nigra*). Groundcover included skunk

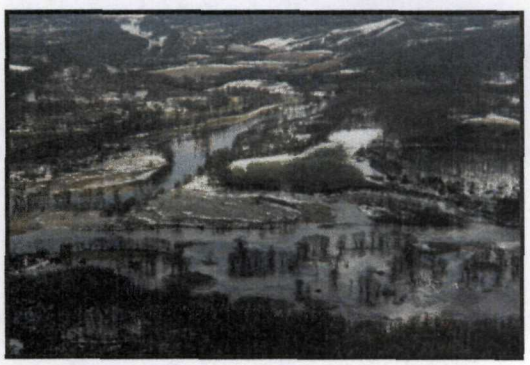
cabbage (*Symplocarpus foetidus*), *Carex* sp. (sedge), and *Rosa palustris* (swamp rose).

Appendix D presents photographs of typical emergent plant communities along the bank. The hydrophytic plant community along the bank met the third criteria to be considered a wetland. Appendix A presents a list of plants, hydric soil conditions, and hydrological characteristics for Reach D study area.

3.6 Reach E -Otsego Dam to Trowbridge Dam

3.6.1 Field Observations

The distance between the Otsego Dam and the Trowbridge Dam impoundment area is approximately 4.6 miles. Schnable Brook enters the Kalamazoo River about half way between the two dams. The



Kalamazoo River flooding behind Trowbridge Dam

Kalamazoo River has broad riparian habitats and floodplains supporting a variety of wetland communities (PEM, PSS, and PFO) within Reach E (**Figures 3.6.1** and **3.6.2**).

This area includes 255.5-acres of palustrine emergent, 32.8-acres of palustrine-forested wetlands, 14.2-acres of palustrine shrub-scrub, and 183.0-acres of unconsolidated bottom wetlands. Table 3-5 lists the individual reaches and the acreage of wetlands by community type that are located within the CDM defined floodplain. **Figures 3.6.1** and **3.6.2** present the NWI/Aerial map overlay for Reach E that were used to confirm existing wetland boundaries with potential changes different from the maps. The infrared images and the NWI boundary are presented in **Appendix C** as **Figures C.6** and **C.7**. A vegetable garden was also observed in the riparian habitat just upstream of Otsego Dam. This area contained paper waste residue at a depth greater than 30-inches.

3.6.2 Hydrology

Reach E contains a broad meandering floodplain bounded by steep slopes. The Otsego impoundment to Trowbridge Dam has been drawn down, which exposed the historically deposited sediments and residual paper waste material within the river and floodplain.

The riparian habitat has low enough elevation to receive floodwaters during snow melt and high precipitation events. As a result, the forested and shrub-scrub communities are inundated long enough throughout the growing season to maintain saturated soil conditions. The wetland areas have hydrological indicators that include saturated soils within the upper 12-inches of the surface. Similar areas with no saturated soils within the

upper 12-inches were not considered meeting the hydrological indicator that contained the same type soil characteristics.

Based on this information two revisions within the riparian habitat were made due to hydrological indicators to be a wetland or the area did not have hydrological evidence. **Figures 3.6.1** and **3.6.2** present the location of the NWI map and aerial map. GPS way stations that show the revised NWI areas are Orl1, Orl2, Orl3, Osrl1, Osrl2, Osrl3, Osrl4, and Orl7.

3.6.3 Soils

Figures 3.6.1 and **3.6.2** present the NWI/Aerial map overlay for Reach E. **Figures 3.6.3** and **3.6.4** present the soil maps of the areas in Reach E. Soil types that occur Reach E include: Glendora (2), Oshtemo-Chelsea complex (11B), Brady Sandy loam , Choctah silt , Tekenink loamy fine sand , Sloan silt , Udipsamments , and Algansee loamy sand . All are listed as hydric soils except Udipsamments. The infrared images and the NWI boundary are presented in **Appendix C** as **Figures C.6** and **C.7**.

Hydric soils are present within the riparian habitat, floodplain, and oxbow systems. However, the absence of inundation has changed a portion of this system to an upland community. The soils in the remnant oxbow systems lack hydric indicators, and have aerobic soil characteristics as noted in the USACE field forms. Hydrological indicators are present near Schnable Brook and the smaller un-named tributary where flood waters extend over the top of the bank for a short period of time during the spring snow melt and high flow events. Floodwaters do not extend as far as they did prior to when the impoundments were in place. These areas have dried out enough to allow upland plant species to colonize in these transitional areas as well as the absence of hydrological indicators and aerobic soil conditions.

Two areas were identified as contradicting the 1981 NWI wetland map for Reach E. The wetland survey indicated one PEM included on the north bank, approximately 1,000 feet south of M-89 highway (GPS Osrl 1, 2, 3, & 4 in **Figure 3.7.2**), which was determined to be upland. The area consisted of emergent plant species, hydric soils conditions, and no evidence of hydrology. The second area was a community change from shrub-scrub species to upland. The area contains an upland forest with no residual soils. This area is on the north bank that is adjacent to an oxbow (GPS Orl3 in **Figure 3.6.1**).

3.6.4 Vegetation

The wetland systems are classified as palustrine emergent (PEM), palustrine shrub-scrub wetlands (PSS) and palustrine forested wetlands (PFO). **Appendix D** presents photographs of the site that depict the emergent plant community along the bank. The dominant herbaceous plant community along Reach E study area consists of canary grass, stinging nettle, cattail, and loosestrife. Hardwood wetland trees dominant many areas along Reach E study area. Dominant trees include Carolina willow, box elder, red maple, locust,

and American beech. **Appendix A** presents a detailed list of plants, hydric soil conditions, and hydrological characteristics for Reach E study area. **Table 3-2** presents a list of vegetation observed along the Kalamazoo River study area. Along the bank is an abandoned garden site that was surveyed for wetland indicators. While the garden area had upland and wetland species, a soil pit dug to a depth of more than 30 inches had no standing water. This area was therefore determined to not be a wetland. The approximate wetland boundary was determined to be within 10 feet of the north bank at this location (GPS waypoint OC 1 in **Figure 3.6.2**). Table 3-4 presents the list of vegetation observed within the garden area study area s Site. The hydrophytic plant community along the bank met the final criteria to be considered a wetland.

3.7 Reach F - Trowbridge Dam to Allegan City Dam

3.7.1 Field Observations

The distance between Trowbridge Dam to Allegan City Dam along the Kalamazoo River is approximately 9.1 miles and covers seven wetland community types with a broad riparian habitat area between the two impoundments (**Figures 3.7.1, 3.7.2** and **3.7.3**). This area includes 58.1-acres of palustrine emergent wetlands, 590.1-acres of palustrine forested wetlands, 252.4-acres of unconsolidated bottom wetlands, 1.2-acres of Aquatic Bed, 15.6-acres of Open Water/Unknown Bottom, 49.3-acres of shrub-scrub wetlands, and 23.2-acres of unconsolidated shore. Table 3-5 lists the individual reaches and the acreage of wetlands by community type that are located within the CDM defined floodplain.

3.7.2 Hydrology

Reach E contains a broad meandering floodplain bounded by high banks. The Trowbridge Dam impoundment to Allegan City Dam has been drawn down, which exposed the historically deposited sediments and residual waste material within the river and floodplain.

The riparian habitat has low enough elevation to receive floodwaters during snow melt or high precipitation events. As a result the forested and shrub-scrub communities are inundated long enough throughout the growing season to maintain saturated soil conditions. The wetland areas have hydrological indicators that include saturated soils within the upper 12-inches of the surface. Similar areas with no saturated soils within the upper 12-inches were not considered meeting the hydrological indicator that contained the same type soil characteristics. Based on this information two revisions within the riparian habitat were made due to hydrological indicators to be a wetland or the area did not have hydrological evidence.

3.7.3 Soils

Figures 3.7.1, 3.7.2 and **3.7.3** present the NWI/Aerial map overlay for Reach F. **Figures 3.7.4** and **3.7.5** present the soil maps of the areas in Reach F. Soil types that occur in Reach F include: Oakville fine sand , Cohoctah , Arents

& Histosols , Sloan silt , and Algansee loamy silt . All are listed as hydric soils, except Oakville . The infrared images and the NWI boundary are presented in **Appendix C** as **Figures C.8** through **C.10**.

Kalamazoo River behind Allegan City Dam

Hydrologically speaking, the water levels in this reach do not fluctuate significantly, and are confined within steep banks. This meandering sinuous reach has high steep slopes that define the wetland boundary. This reach also contains islands and wide oxbows that support emergent species, shrub-scrub plants, and trees. Upland soils lack hydric indicators (dry below 12 inch from the surface) and have aerobic soil characteristics as noted in the USACE field forms.

Two areas were identified as contradicting the 1981 NWI wetland map for this reach. The wetland survey indicated one palustrine emergent wetland (PEM) included on the south bank, approximately 1,000 feet south of M-89 highway (GPS waypoint Talb1 in **Figure 3.7.3**). The area consisted of emergent plant species, hydric soils conditions, and strong evidence of hydrology. The second area was a community name change from upland to shrub-scrub species. The shallow area contains willows. This area is on the south bank that extends along the river (about 300 ft north of GPS waypoint TL1 in **Figure 3.7.3**).

3.7.4 Vegetation

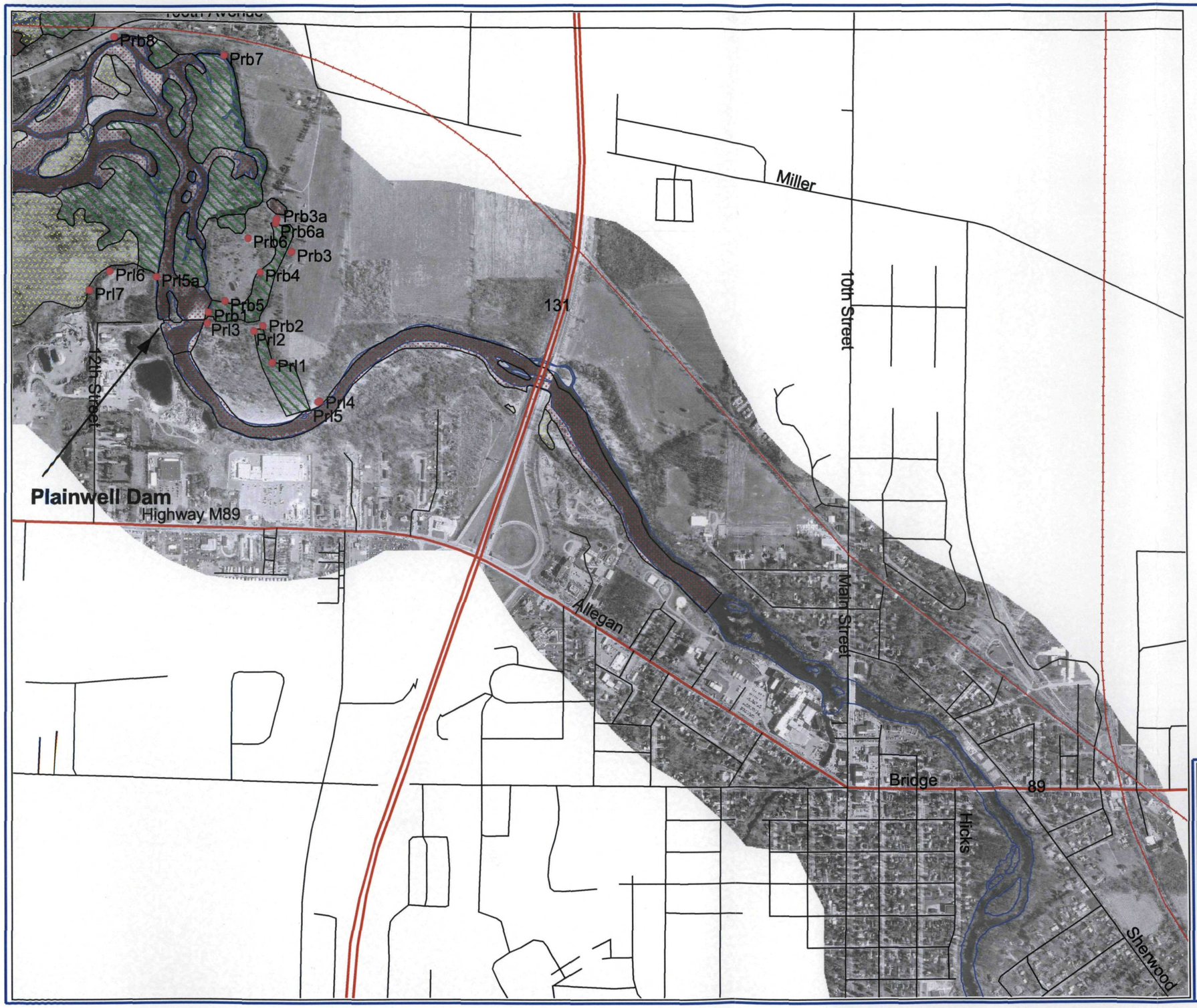
The wetland systems are classified as palustrine emergent (PEM), palustrine shrub-scrub wetlands (PSS) and palustrine forested wetlands (PFO). **Appendix D** presents photographs of the site that depict the emergent plant community along the bank. The dominant herbaceous plant community along Reach F study area consists of canary grass, stinging nettle, cattail, and loosestrife. Hardwood wetland trees dominant many areas along Reach F study area. Dominant trees include Carolina willow, box elder, red maple, locust, and American beech. The hydrophytic plant community along the bank met the final criteria to be considered a wetland. Appendix A presents a detailed list of plants, hydric soil conditions, and hydrological characteristics for Reach E study area.

Table 3-2 presents a list of vegetation observed along the Reach F Kalamazoo River study area.

3.8 Summary

One Portage Creek tributary and five Kalamazoo River reaches were surveyed to determine the approximate wetland boundary and to confirm the 1981 NWI wetland maps. Eleven areas were identified within the study area that confirmed wetland characteristics or were void of wetland

characteristics. These changes were incorporated into the revised wetland NWI maps. GPS waypoints (red dot with station identification number) within each figure indicate where a wetland area was changed (added or deleted) or was verified. Photos were taken of typical wetland areas encountered during the field survey, and are provided in **Appendix D**.



Wetland Study Area

Reach B

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

N

0 1000 2000 Feet

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*On 11" x 17" landscape print-out

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Detroit, Michigan 48226
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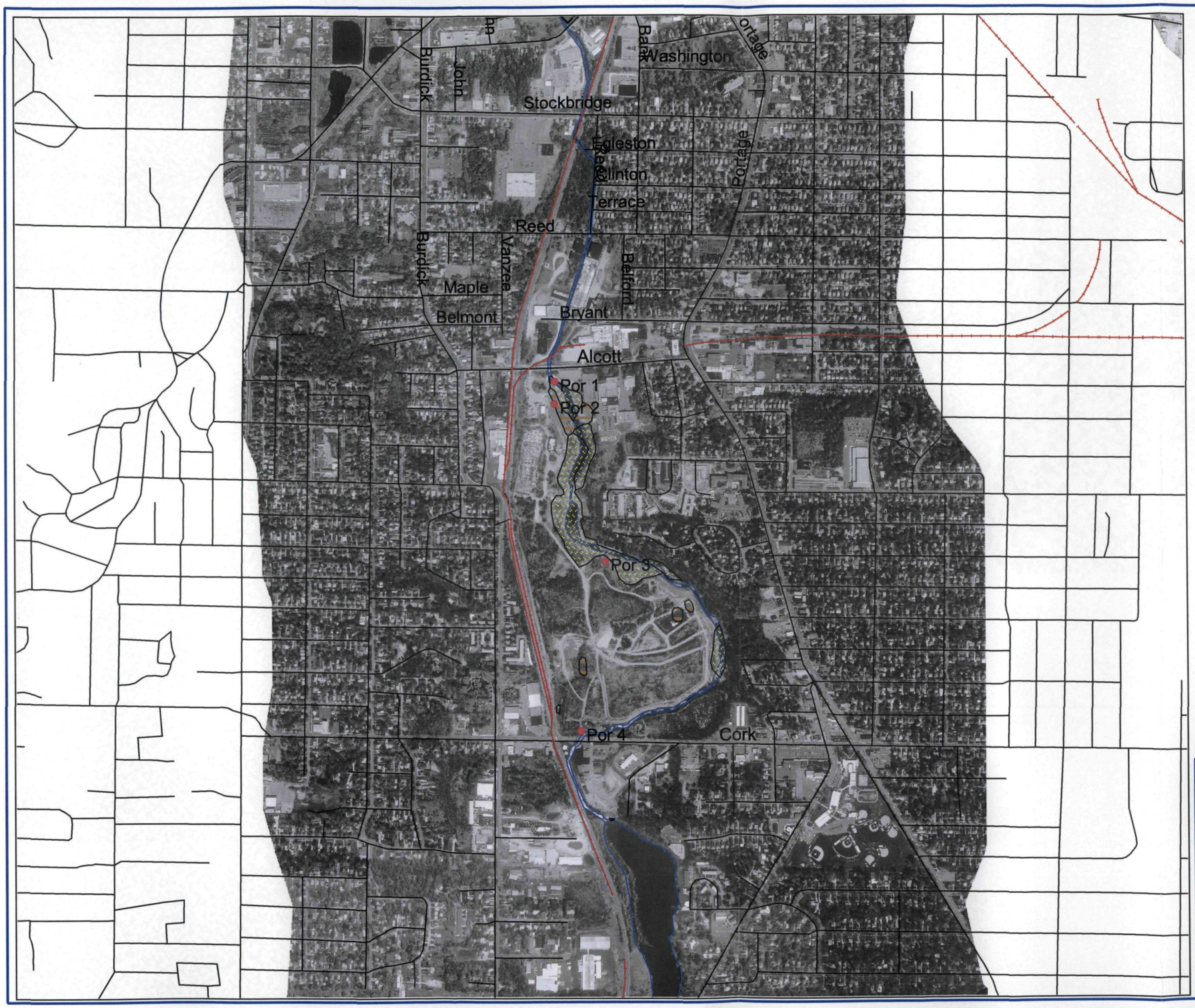
Fax: (313) 963-3130

Prepared By:
- J. Harness
Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach B
City of Plainwell to Plainwell Dam Impoundment

Figure 3.3.1



Wetland Study Area

Reach PC

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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Reach PC
Portage Creek

Figure 3.2.1

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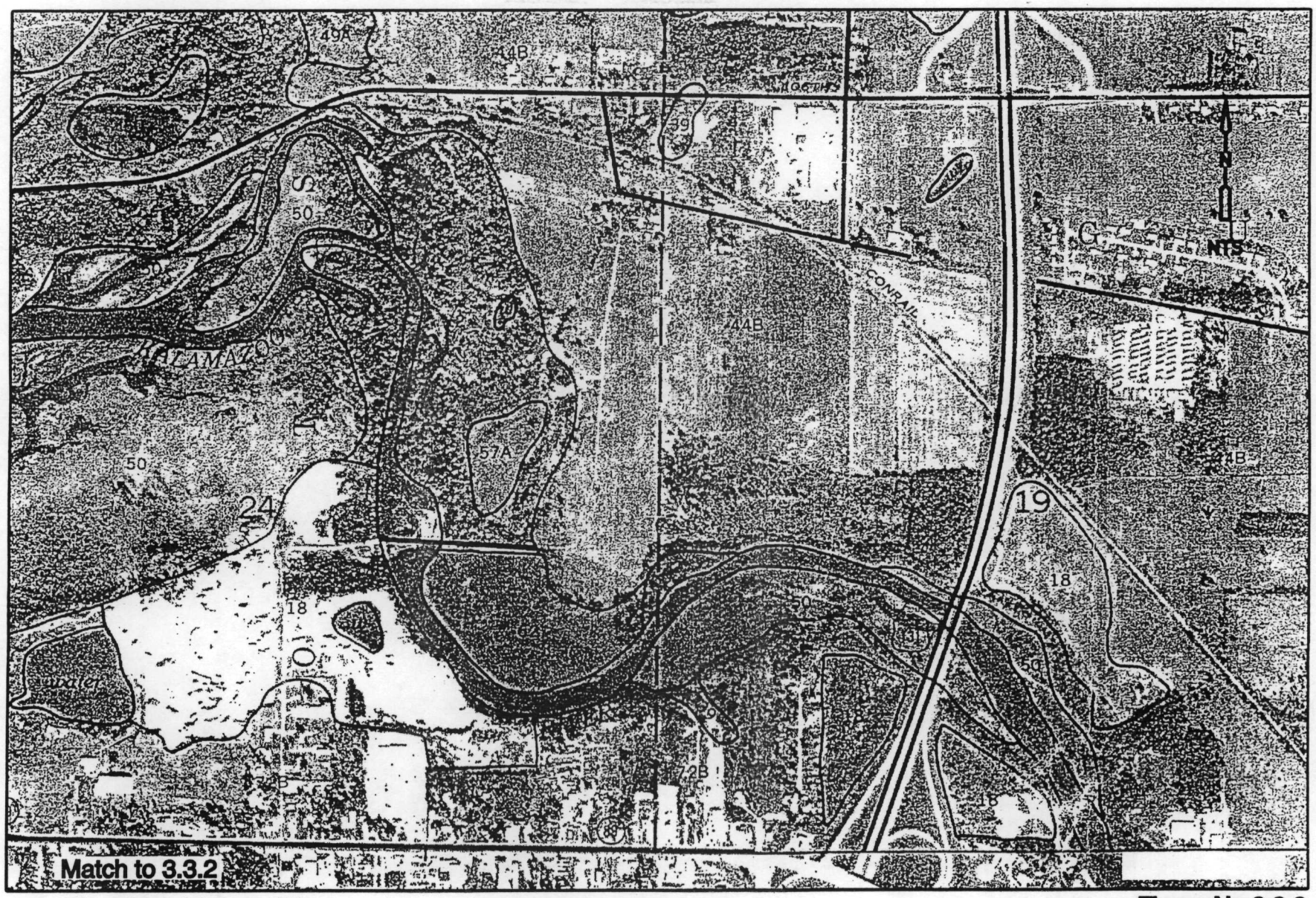
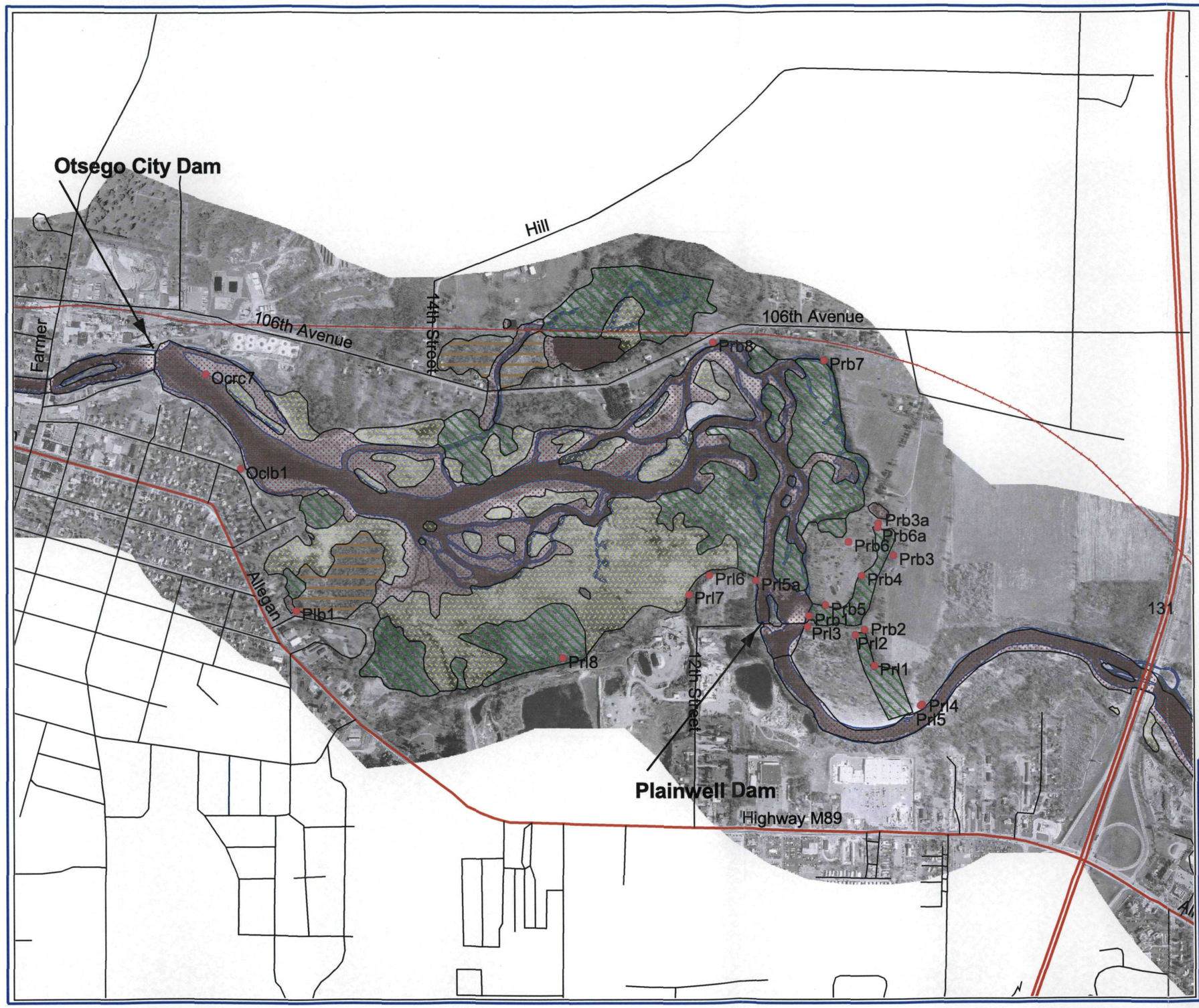


Source: Allegan County Soil Survey 1987

Figure No.3.3.2
Allied Paper, Inc./Portage Creek/
Kalamazoo River Superfund Site
Soil Map-Reach B City of Plainwell to Plainwell Dam

CDM Camp Dresser & McKee



Wetland Study Area

Reach C

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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Reach C
Plainwell Dam Impoundment to Otsego City Dam Impoundment

Figure 3.4.1

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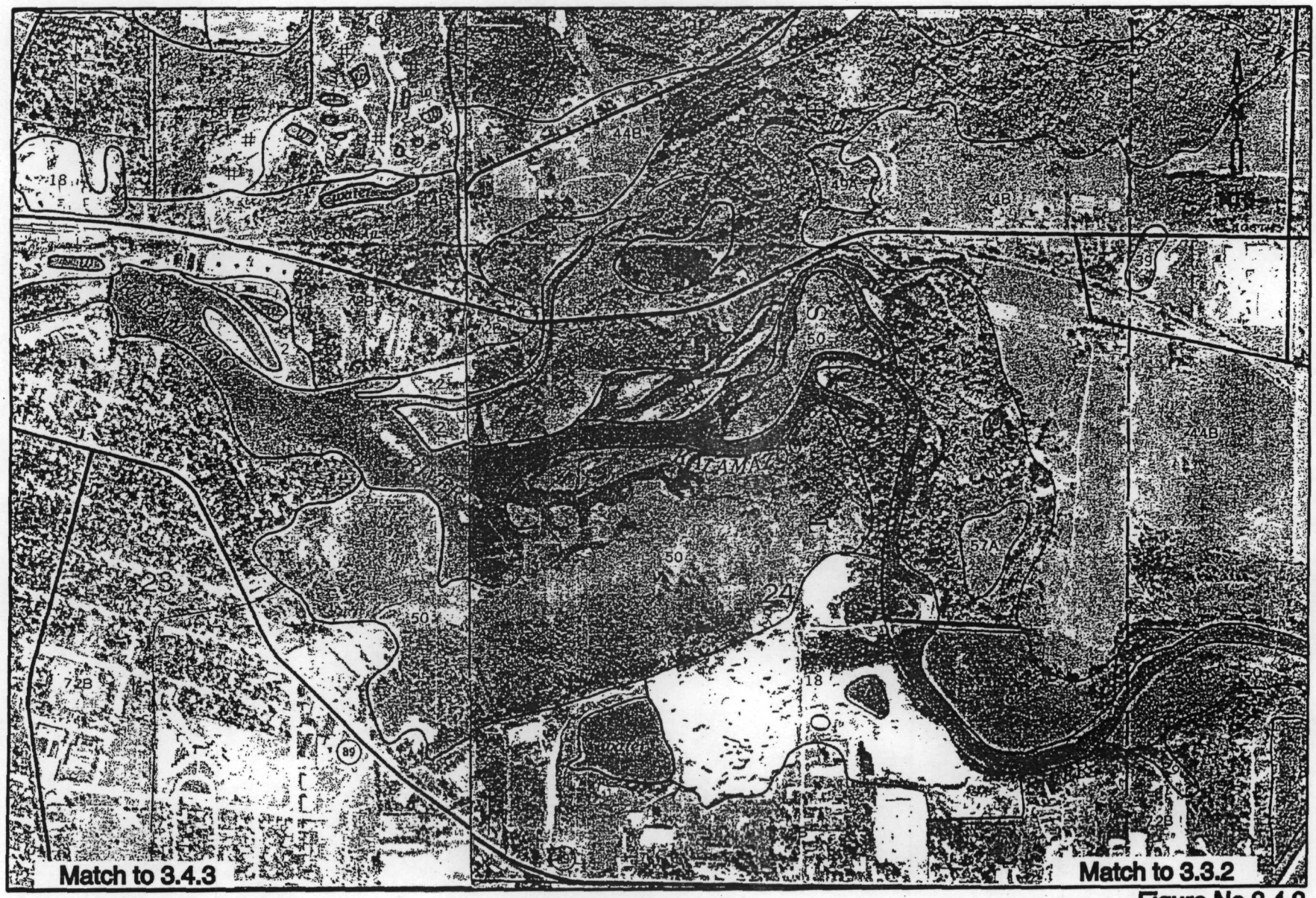

Source: Allegan County Soil Survey 1987

Figure No.3.4.2
Allied Paper, Inc./Portage Creek/
Kalamazoo River Superfund Site
Soil Map - Reach C Plainwell Dam to Otsego City Dam

CDM Camp Dresser & McKee

Wetland Study Area

Reach D

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

Otsego City Dam

Avenue

River

106t

Plc2

Plc1

Ocrc1

Lincoln

North

Farmer

Allegan

Oclb1

Allegan

efferson

19th Street

18th Street

104th Avenue

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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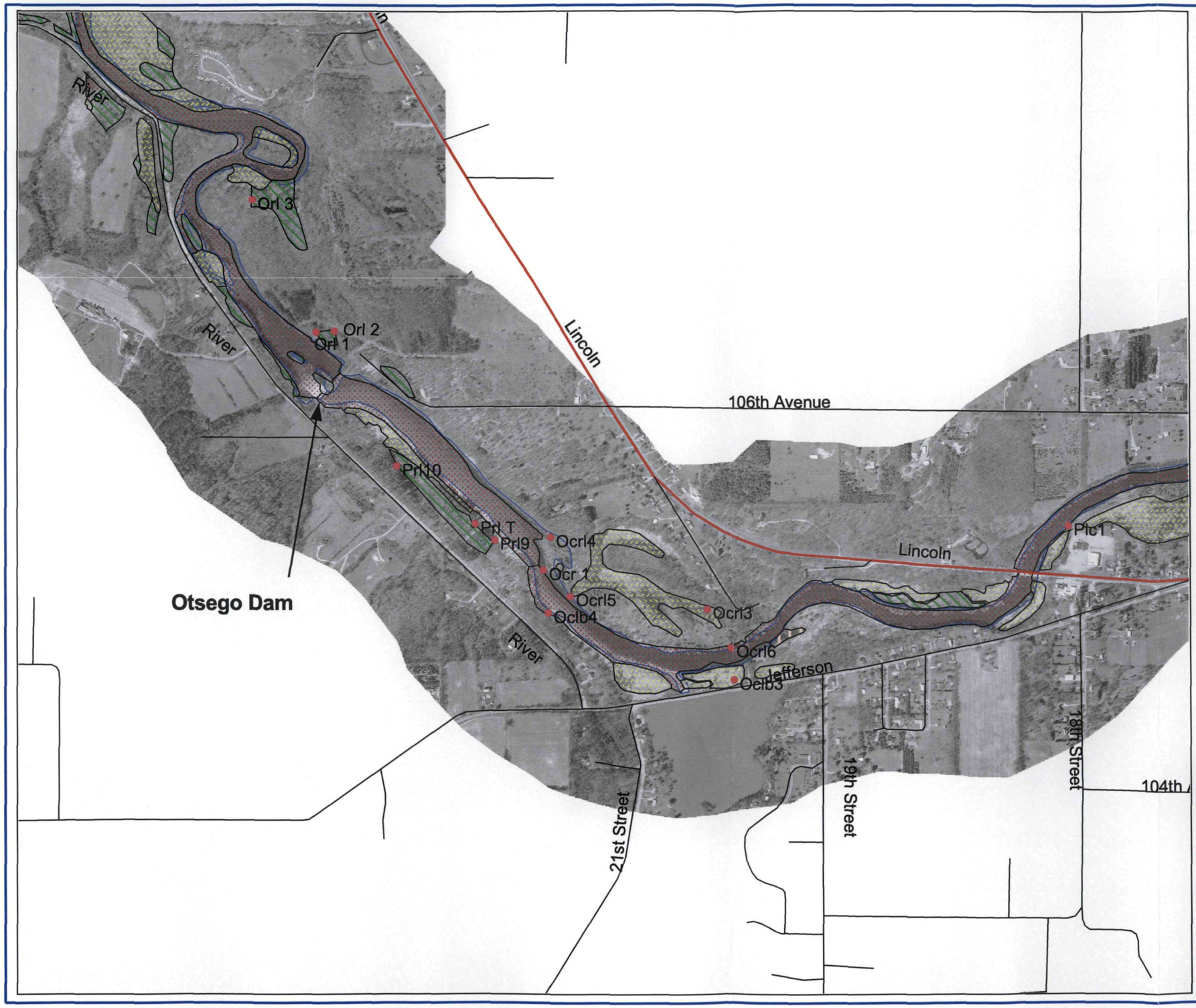
Reach D
Otsego City Dam Impoundment to Otsego Dam Impoundment

Figure 3.5.1



Wetland Study Area

Reach D

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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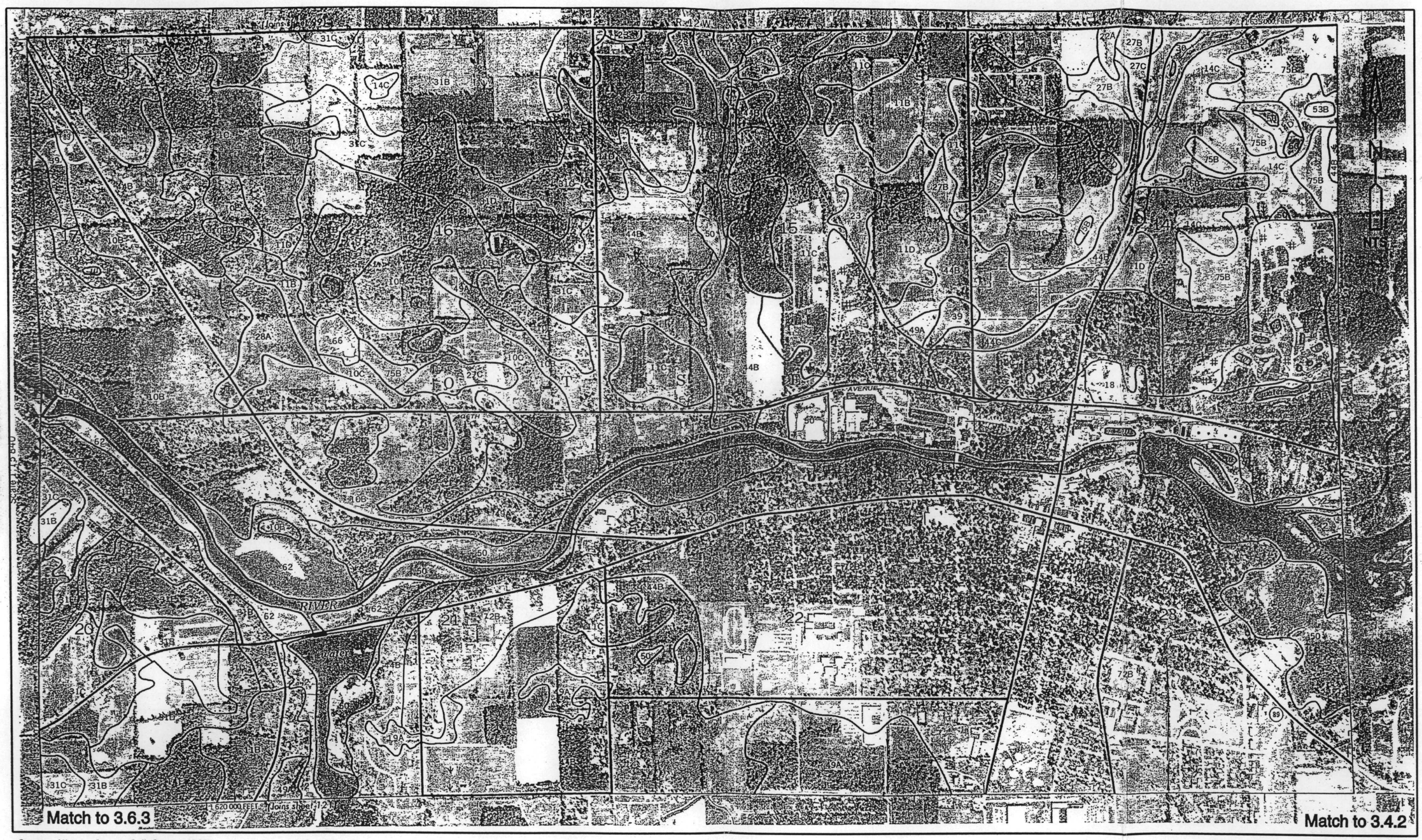
Reach D
Otsego City Dam Impoundment to Otsego Dam Impoundment

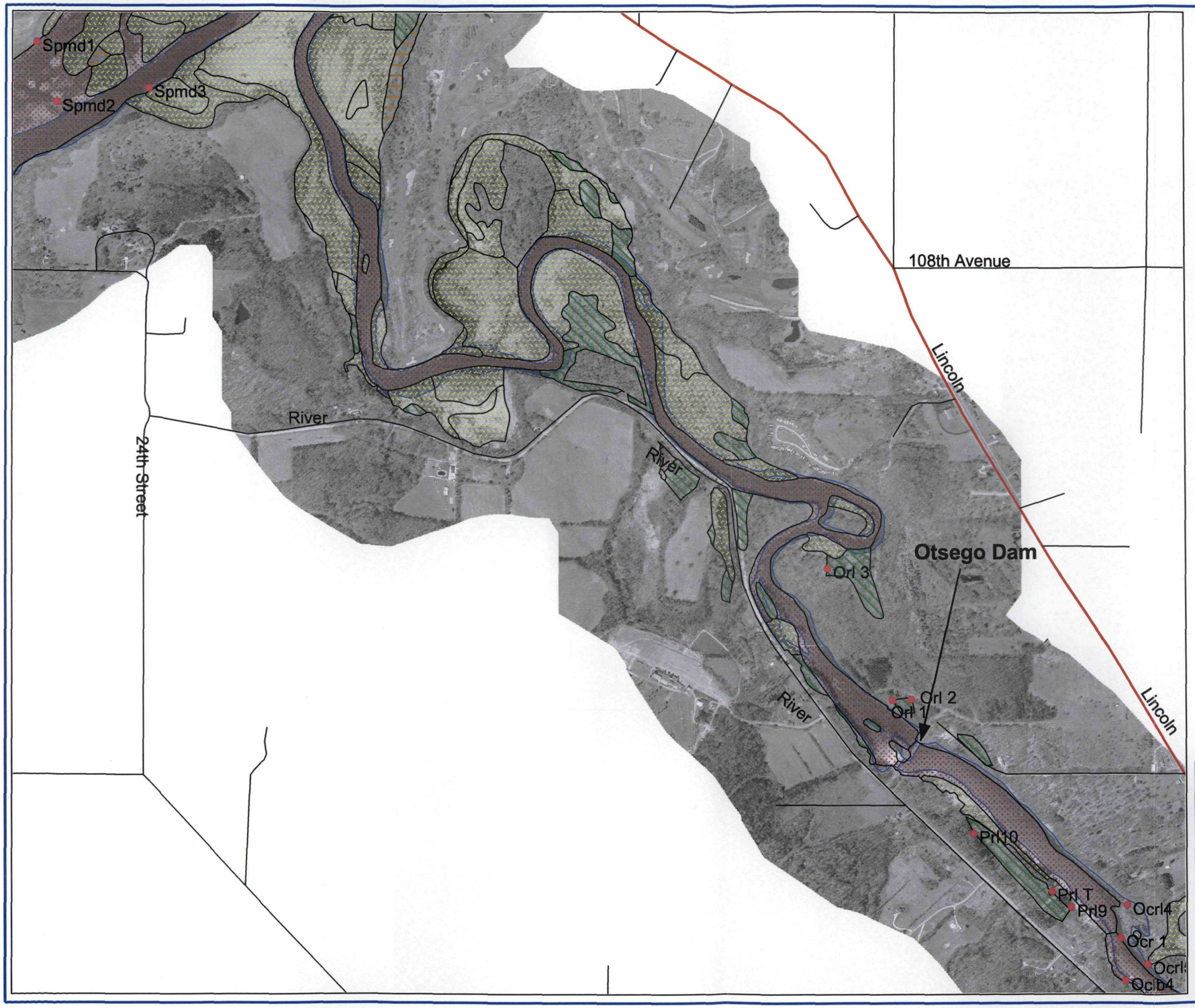
Figure 3.5.2



Source: Allegan County Soil Survey 1987

CDM Camp Dresser & McKee

Figure No.3.5.3
Allied Paper Inc./Portage Creek/
Kalamazoo River Superfund Site
Soil Map Reach D Otsego City Dam to Otsego Dam



Wetland Study Area

Reach E

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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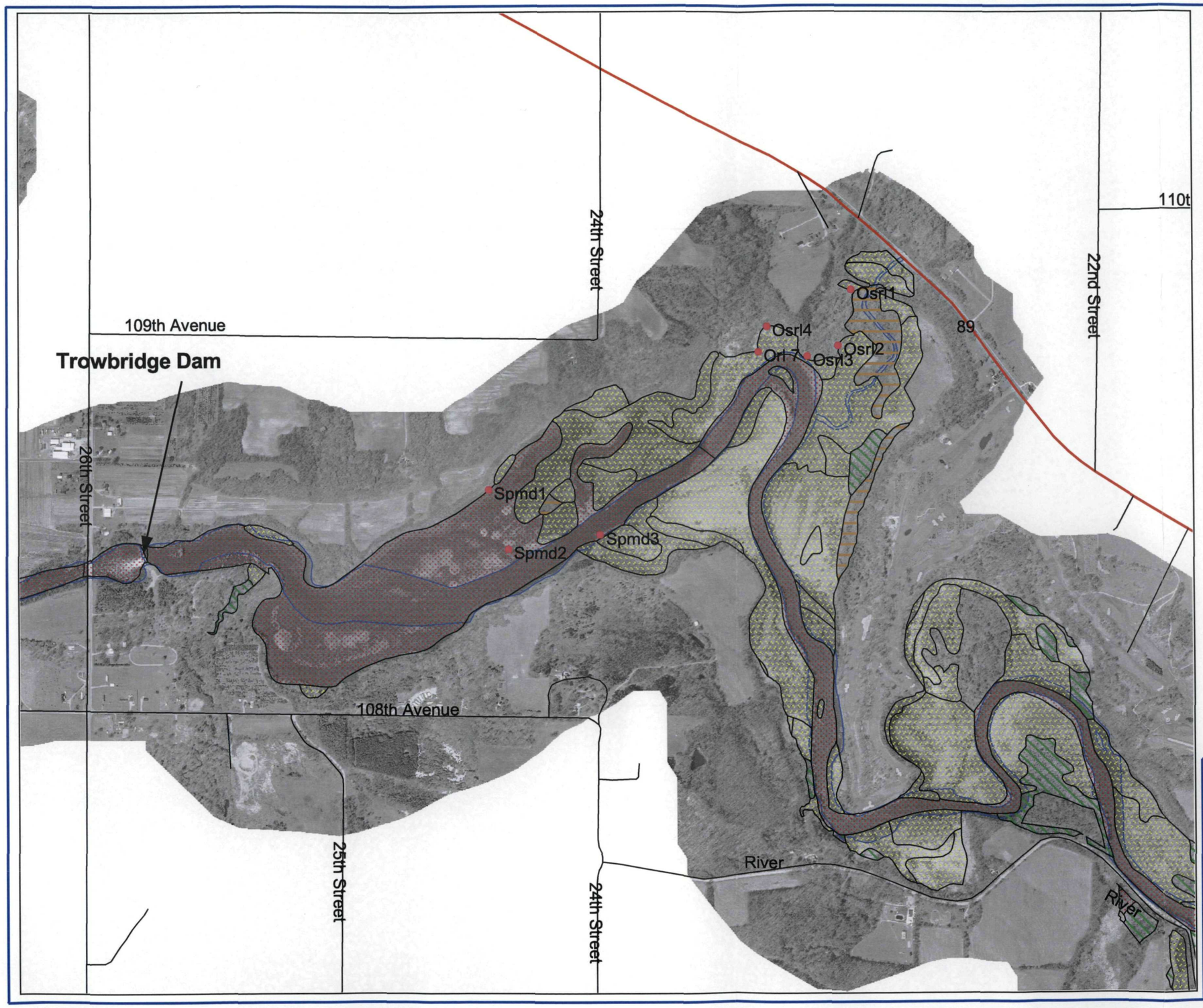
Reach E
Otsego Dam Impoundment to Trowbridge Dam Impoundment

Figure 3.6.1



Wetland Study Area

Reach E

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
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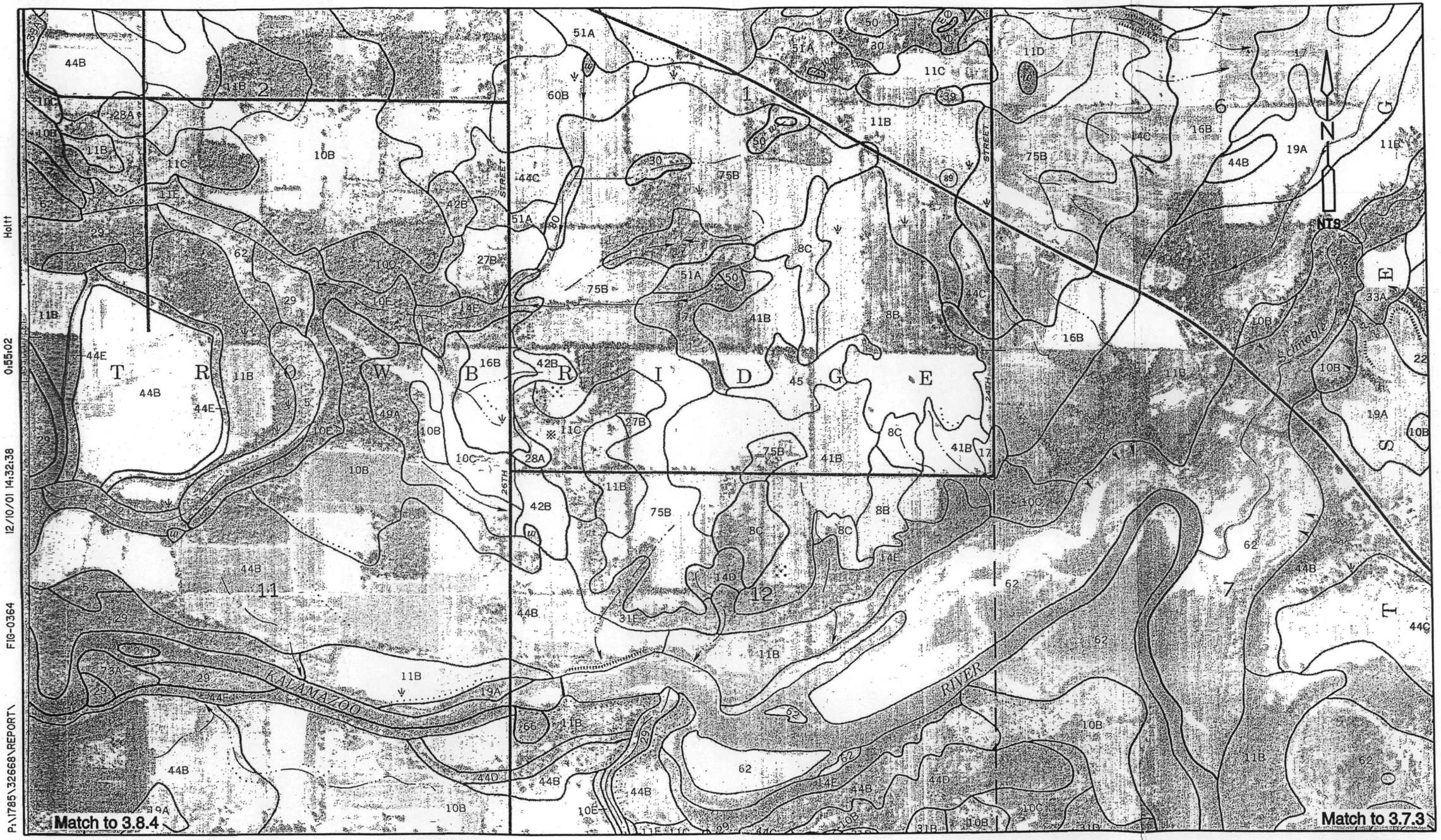
Reach E
Otsego Dam Impoundment to Trowbridge Dam Impoundment

Figure 3.6.2

Sorce: Allegan County Soil Survey 1987

Figure No.3.6.3
Allied Paper Inc./Portage Creek/
Kalamazoo River Superfund Site
Soil Map - Reach E Otsego Dam to Trowbridge Dam

CDM Camp Dresser & McKee



Source: Allegan County Soil Survey 1987

Figure No.3.6.4
Allied Paper, Inc./Portage Creek/
Kalamazoo River Superfund Site
Soil Map - Reach E Otsego Dam to Trowbridge Dam

CDM Camp Dresser & McKee

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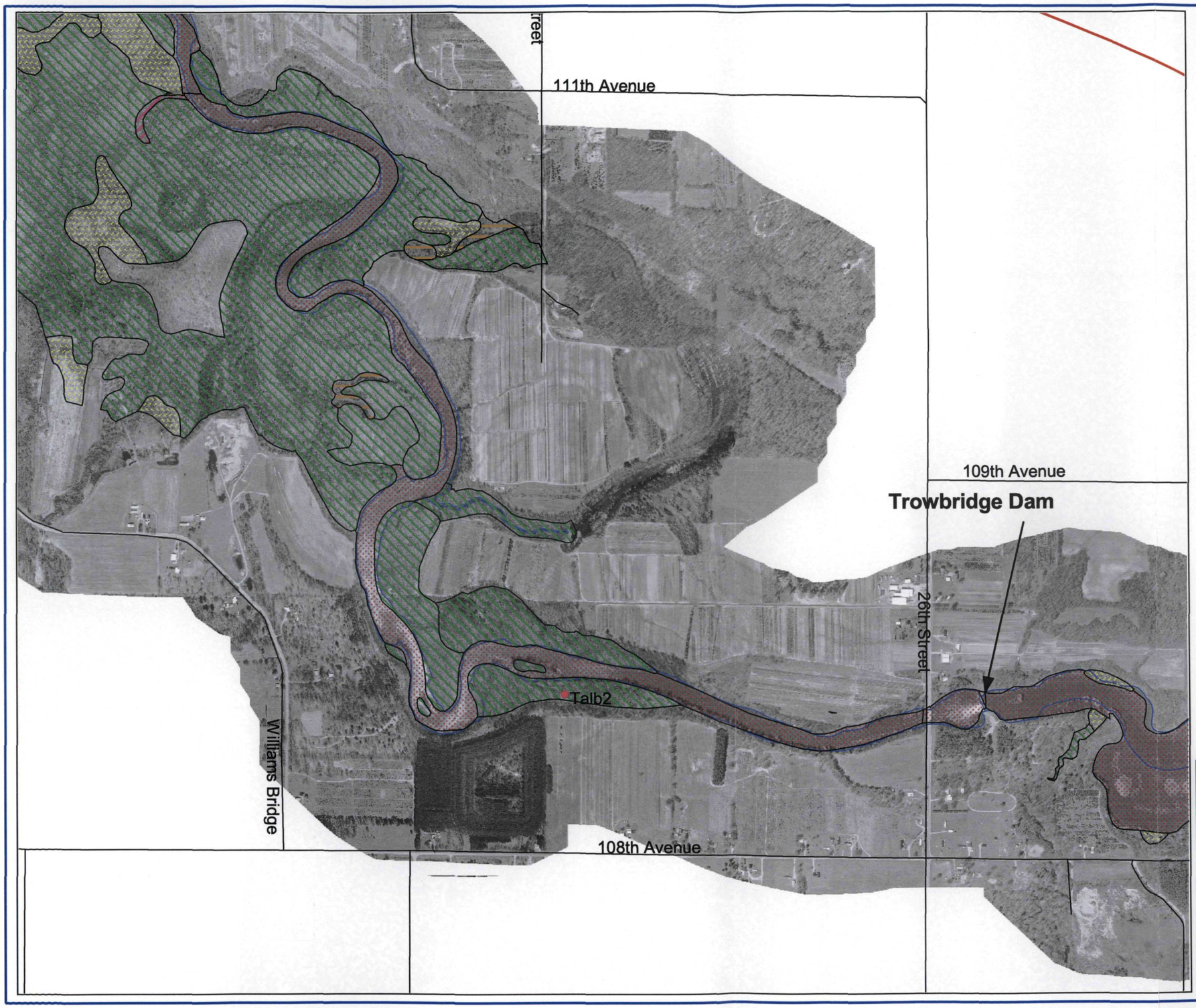

Wetland Study Area

Reach F

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

Notes:
(1) Base map data derived from Michigan Framework.
(2) Wetland data derived from ground truthing of NWI maps.

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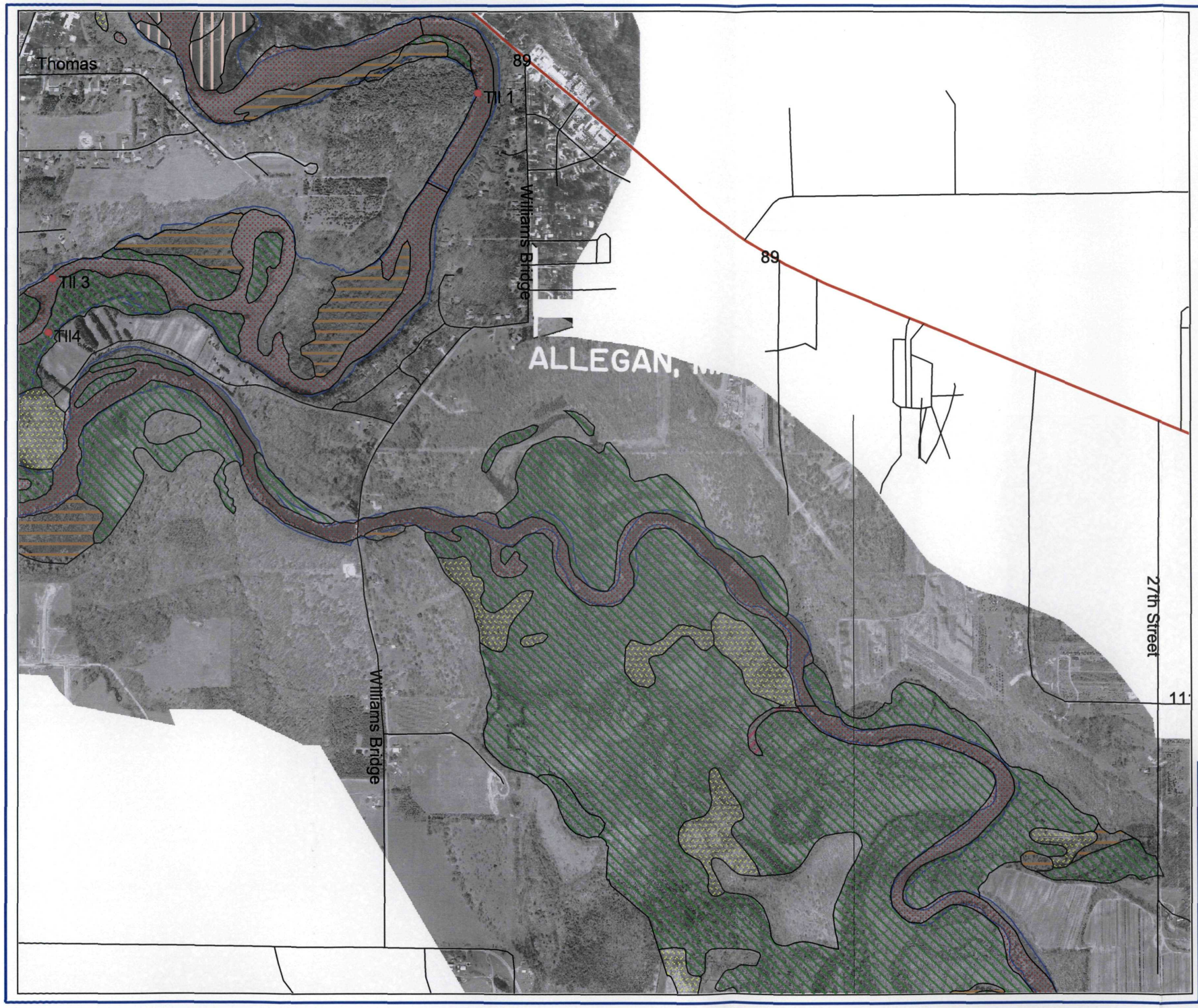
Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure 3.7.1



Wetland Study Area

Reach F

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore
- Waypoints
- River
- Railroad
- Local roads
- Highways

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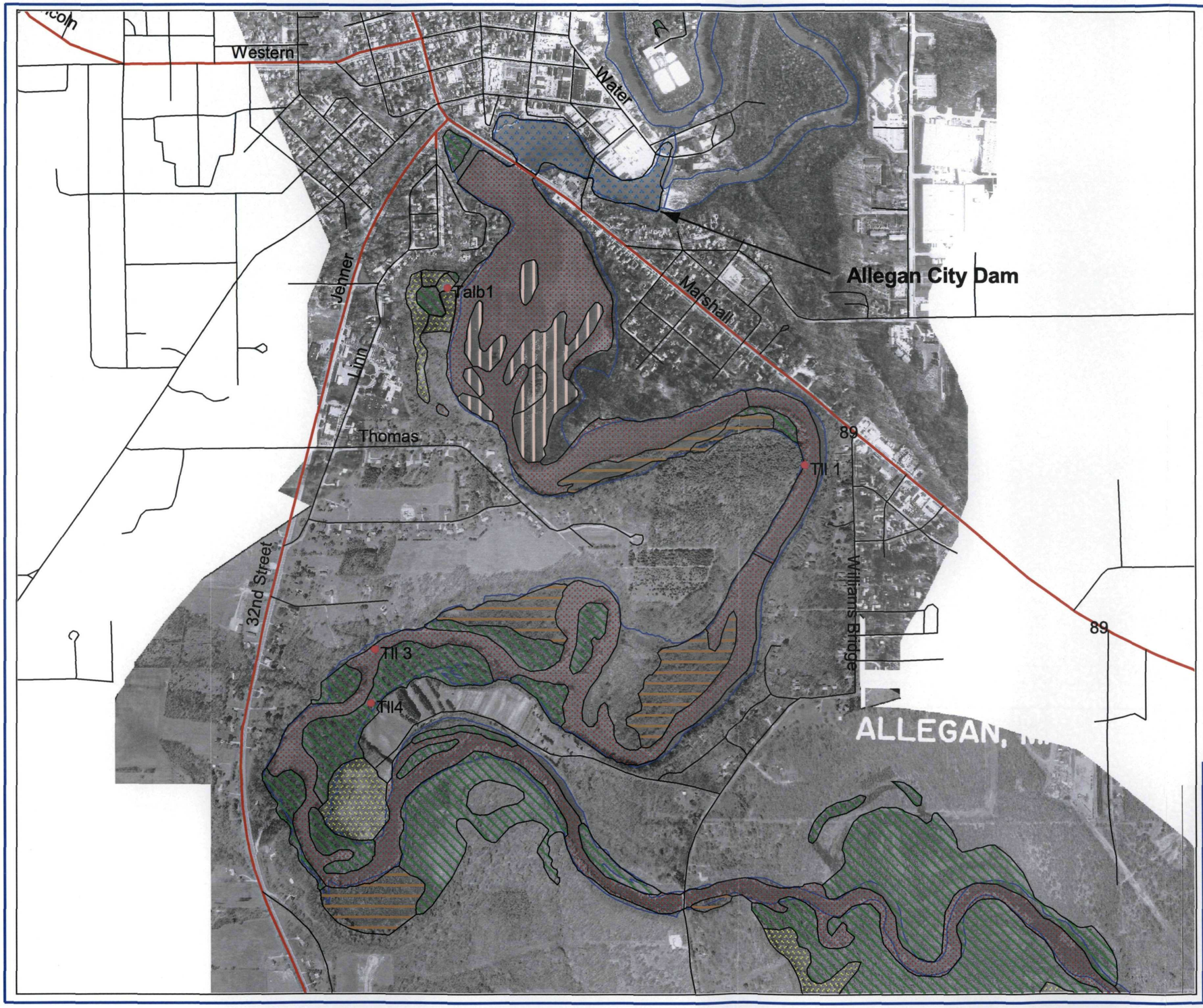
Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure 3.7.2



Wetland Study Area

Reach F

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

- Waypoints
- River
- Railroad
- Local roads
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Notes:
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Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure 3.7.3

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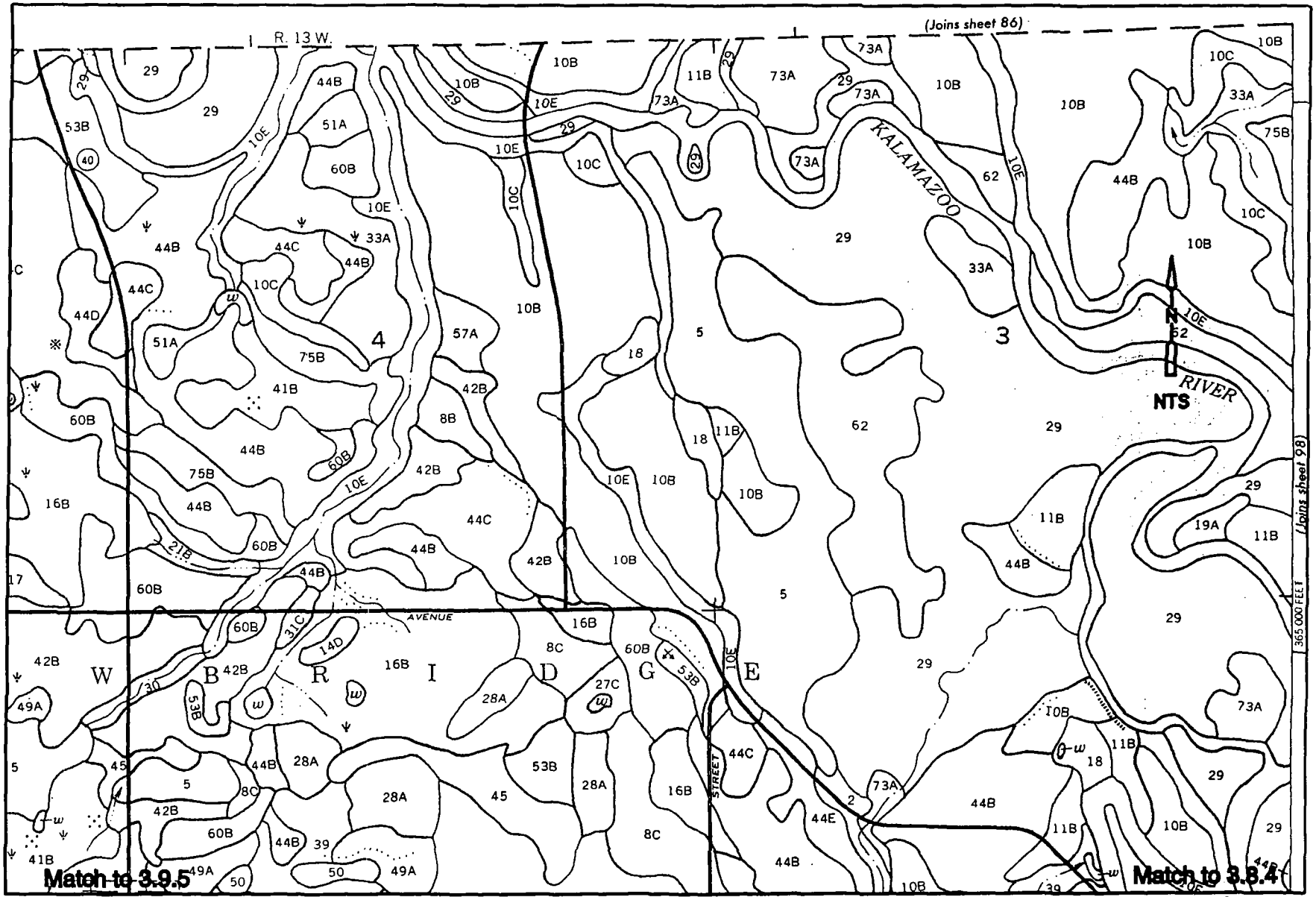

Source: Allegan County Soil Survey 1987

Figure No.3.7.4
Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site
Soil Map - Reach F Trowbridge Dam to Allegan City Dam

CDM Camp Dresser & McKee

Figure No.3.7.5
Allied Paper, Inc./Portage Creek/
Kallamazoo River Superfund Site
Soil Map - Reach F Trowbridge Dam to Allegan City Dam

CDM Camp Dresser & McKee

Section 4
Wetland Delineation Summary

Michigan Department of Environmental Quality contracted with Camp Dresser & McKee to conduct a wetland delineation study along the Kalamazoo River and Portage Creek, within the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The results of this study will assist the regulatory agencies in making remedial decisions for the Site.

Portage Creek as it flows through the Operable Unit 1 in Portage, Michigan and the Kalamazoo River as it flows from the City of Plainwell to the City of Allegan were surveyed to determine the approximate wetland boundary and to confirm the 1981 NWI wetland maps. One reach within Portage Creek was delineated and five reaches on the Kalamazoo River were delineated using U.S. Army Corps of Engineers wetland delineation methodology.

Ten areas were identified within the study area that confirmed wetland characteristics or were void of wetland characteristics. These changes were incorporated into the revised wetland NWI maps. GPS waypoints (red dot with station identification number) within each figure indicate where a wetland area was changed (added or deleted) or was verified. Photos were taken of typical wetland areas encountered during the field survey, and are provided in **Appendix D**.

4.1 Portage Creek

The dominant wetland communities along Portage Creek (Reach PC) include **emergent wetlands**, characterized by cattails, bulrushes, reed canary grass and sedges; **shrub-scrub wetlands**, characterized by buttonbush, wild rose, elderberry and poison ivy. Common trees that are observed in the area include will and cottonwoods.

Purple loosestrife, an evasive species, is beginning to establish itself after recent remediation and restoration of the Portage Creek floodplain. This plant will crowd out the newly establish plant species if not controlled.

4.2 Kalamazoo River

Five reaches of the Kalamazoo River were delineated between the City of Plainwell downstream to the City of Allegan. This section of the river is characterized as a flowing stream that is impounded by five dams (Plainwell, Otsego City, Otsego, Trowbridge and Allegan City Dam). Three of these impounded areas (Plainwell, Otsego and Trowbridge) have had their superstructures removed down to the sill, which has resulted in the exposure of large tracts of sediments. These exposed sediments consists of PCB paper waste residual materials discharged by the paper companies, and residual organic matter. The exposed sediments have naturally re-vegetated over time and the established plant communities consisting of grasslands, shrubs and forests.

The dominant wetland communities in this section of the Kalamazoo River include: emergent wetlands, shrub-scrub wetlands and forested wetlands. Common plants in the emergent wetlands include cattails, rushes, stinging nettles and reed canary grass. Dominant shrubs include swamp rose, sumac, elderberry, buttonbush, Russian olive and privet. Common trees in the forested wetlands include maples, beeches, dogwoods, green ash, sycamores, willows and cottonwoods.

Existing NWI maps were modified when the ground-truthing of these wetlands were not consistent with the NWI maps. GPS locations were taken in those areas where the wetland boundary was changed. Ten areas were identified in this section of the Kalamazoo River where wetland boundaries were modified.

Pockets of standing water were observed in the exposed sediments, away from the Kalamazoo River (behind Plainwell and Trowbridge dams). These standing pockets of water could be remnants of past flooding or share a hydrological connection with the river.

The wetland communities in this section of the Kalamazoo River are extensive and diverse and provide habitat for a wide variety of aquatic, semi-aquatic and terrestrial wildlife. The exposed sediments consist of gray clays from paper waste residuals and may limit the development of selected vegetation that occur in areas of native soil.

In fact, the majority of the area behind Plainwell dam possesses vegetative characteristics typical of an upland even though the area is located within the Kalamazoo River floodplain.

Section 5
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Appendix A

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Brenda Beatty & Lynn Cudlip	Date: 6-20-01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRL 1

[redacted] wet

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo	T	FACW-	9.		
2. Ulmus rubra	T	FAC	10.		
3. Crataegus crus-galli	T	FAC	11.		
4. Gleditsia triacanthos	T	FAC	12.		
5. Urtica dioica	herb	FAC+	13.		
6. Phalaris arundinacea	herb	FACW+	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100%

Describe Morphological Adaptations:

Remarks: > 50% FAC or wetter

HYDROLOGY

X Recorded Date (Describe in Remarks): __ Stream, Lake, or Tide Gage ✓ Aerial Photograph __ Other X No Recorded Data Available	Wetland Hydrology Indicators: __ Inundated __ Saturated in Upper 12 Inches __ Water Marks __ Drift Lines __ Sediment Deposits ✓ Drainage Patterns in Wetlands __ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ____ (in.) Depth to Free Water in Pit: ____ (in.) Depth to Saturated Soil: > 18 (in.)	

Remarks: [redacted] INDICATORS PRESENT : Drainage Patterns in wetlands

PRL 1

SOILS

Map Unit Name: 62 Sloan — Drainage Class: very poorly drained

Field Observations — Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): 62 Fine loamy, mixed mesic Fluvaquentic Haplaquolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	5Y 3/1			Clayey
12-15	E	10YR 4/2			sandy

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: clay residual from pulp paper material.
sand below: soils listed on local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: For upland area: VEGETATION: Acer negundo, Gleditsia tricanthos & Phalaris arundinacea

Hydrology: > 18" wt. soils: 0-6" Brown sandy loam
6-12" orange brown loam w/ gravel

upland: Does not meet hydrology criteria for wetlands

Quercus rubra – FACU
Phytolacca americana FAC-

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: KALAMA ZOO RIVER Applicant/Owner: Investigator: JIM LEE, BRENDA BEATTY & LYNN CUDLIP	Date: 6-20-01 County: ALLEGAN State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRL2

WET

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Gleditsea tricanthos	T	FAC	9.		
2. Acer negundo	T	FACW	10.		
3. Crataegus crus-galli	T	FAC	11.		
4. Ulmus rubra	T	FAC	12.		
5. Phytolacca americana	herb	FAC-	13.		
6. Parthenocissus quinque Virde		FAC-	14.		
7. Alliaria petiolata	herb	FAC	15.		
8. Urtica dioica	herb	FAC+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100%

Describe Morphological Adaptations:

Remarks: > 50% FAC or wetter

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage X Aerial Photograph ___ Other X No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: Drainage patterns in wetlands
Soils moist @ 12"

PRC 2

SOILS

Map Unit Name: (62) Sloan — Drainage Class: very poorly drained
Field Observations

Taxonomy (Subgroup): Fine loamy mixed mesic Fluvaquents Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	5Y 2.5/1			Clayey

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Grey Clay residual from pulp paper material. Listed on Local Hydric Soils List. Moist soils at 12" from surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: For upland: same vegetation
Hydrology: none present > 18"+
Soils: Grey Clay soils (residual)

Upland area: FAC species. No hydrological indicators present.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Brenda Beatty, Lynn Cudlip	Date: 6-20-01 County: ALLEGAN State: MI
Have vegetation, soils, or hydrology been disturbed? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRL 3

WET

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo.	T	FACW-	9.		
2. Urtica dioica	H	FAC+	10.		
3. Phalaris arundinacea	H	FACW+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100%

Describe Morphological Adaptations:

Remarks: > 50% FAC, FAC-W or Wetter

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- X Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Drainage Patterns in wetlands

SOILS PRL3

Map Unit Name: (62) Sloan Drainage Class: very poorly drained
Field Observations
Taxonomy (Subgroup): Fine loamy mixed mesic Fluvaquents Confirm Mapped Type? (Yes) No
Haplaquolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6"	A	5 Y3/1			Clay - Gray residual
6-12"	E	same			(earthworm present)

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Grey clayey residual paper material.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)	(Circle)
Hydric Soils Present?	(Yes)	No	
Wetland Hydrology Present?	(Yes)	No	Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Met all 3 wetland criteria

upland area: same vegetation but w/ Sambucus canadensis & Vitis. sp.
hydrology: not present - dry
soil: same

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: _____ Investigator: Jim Lee, Justin Woods	Date: 6-20-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PEM Transect ID: Wetland Plot ID: PRL4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo	Tree	FACW-	9.		
2. Sambucus canadensis	shrub	FACW-	10.		
3. Urtica dioica	herb	FAC+	11.		
4. Phalaris arundaria	herb	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC, FACW

Describe Morphological Adaptations:

Remarks: 100% of the species are FAC or FACW.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other X No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves X Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: >12 (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: Hydrological indicators include weak drainage patterns in the sample plot area. Local soil survey indicate this area contains hydric soil listing.

PRL 4

SOILS

Map Unit Name: Sloan (62) Drainage Class: Very poorly drained

Taxonomy (Subgroup): Fluvaquentic haplaquolls Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18	A	Grey residual			residual

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- X Other (Explain in Remarks)

Remarks: soil contains gray residual >18 inches. soils are moist but not saturated within the 12 inches. Below 12 inches soils (residual) contain evidence of saturation.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: The sample point receives runoff of surface water from adj upland slope after a rain event. Soils are saturated for over 10-15 consecutive days. Wetland plants present. All 3 wetland criteria present

Upland area in landward of this point where soil residual is dry up to 15 inches or so. Hydrology is non existent with no drainage patterns. The area west of this point indicates all 3 wetland criteria present.

upstream northside Plainwell Dam UPLAND was wetland

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River	Date: 6-20-01
Applicant/Owner:	County: Allegan
Investigator: Jim Lee ; Justin Woods	State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No)	Community ID: PFO 1C
Is the area a potential Problem Area? Yes (No)	Transect ID:
(If needed, explain on reverse.)	Plot ID: PRL 5

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Gleditsia tricanthos	Tree	FAC	9. Alliaria officinalis	herb	FAC
2. Ulmus rubra	Tree	FAC	10. Phytolacca americana	herb	FAC-
3. Sassafras albidum	Shrub	FACU	11. Podophylum paltatum	herb	FACU
4. Acer rubrum	Tree	FAC	12. Vitis labrusca	vine	FACU
5. Crataegus crus-gali	Tree	FAC	13.		
6. Prunus Virginana	Tree	FAC-	14.		
7. Parthenocissus quinquefolia	vine	FAC-	15.		
8. Toxicodendron radicans	vine	FAC+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 50% FAC or greater

Describe Morphological Adaptations:

Remarks: Greater than 50% are FAC species.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gage
___ Aerial Photograph
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: ______ (in.)

Depth to Free Water in Pit: ______ (in.)

Depth to Saturated Soil: >18 (in.)

Wetland Hydrology Indicators:

___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Other (Explain in Remarks)

Remarks: no hydrological indicators present
no drainage patterns, water marks or saturated soils
in upper 12 inches of the soil.

upstream of Plainwell Dam upland across WCT occ. to NWJ

SOILS

PRL-5

Map Unit Name: Glendora (2) Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Mixed, mesic Mollic Psammaquents Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A	N 2/0			fine sand
10-21		10YR 5/2			fine sand loamy

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: listed as local Hydric Soils list. However weak to no hydric soil characteristics present. no saturated soils within 21 inches

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Hydric Soils Present? Yes (No)
Wetland Hydrology Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks: This area was mapped as PFO 1C on the MWI map. Current indicators show this area as an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: J. Lee, B. Beatty & Lynn Cudlip	Date: 6/20/01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRB1

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	T	OBL	9.		
2. Gleditsia triacanthos	T	FAC	10.		
3. Cornus stolonifera	S	FACW	11.		
4. Cephalanthus occidentalis	S	OBL	12.		
5. Phalaris arundinacea	H	FACW*	13.		
6. Lythrum salicaria	H	OBL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: Greater than 50% FAC, FACW, or OBligate species

HYDROLOGY

- X Recorded Data (Describe in Remarks):
  - X Stream, Lake, or Tide Gage
  - X Aerial Photograph
  - ___ Other
- ___ No Recorded Data Available

Field Observations:

- Depth of Surface Water: _____ (in.)
- Depth to Free Water in Pit: _____ (in.)
- Depth to Saturated Soil: at sfc (in.)

Wetland Hydrology Indicators:

- ___ Inundated
- √ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- √ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches of surface
Drainage patterns in wetlands

PRB1 - Wet

SOILS

Map Unit Name: Glendora LS

Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Mixed, mesic Mollic Psammaquents

Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
12"	B	no color			gravelly sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ✓ Probable Aquic Moisture Regime
- ✓ Reducing Conditions
- ___ Gleyed or Low-Chrome Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ✓ Organic Streaking
- ✓ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Reducing Aquic Moisture regime
Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Upland: Poa sp., Toxicodendron radicans, Solidago sp. Crataegus crus-galli, Gleditsia triacanthos, ~~Aralia spinosa~~ Xanthoxylum americanum, Platanus occidentalis, Medicago lupulina, Daucus carota;

0-4 sandy loam - fairly moist 4-12" fine sand w/ gravel, no H_2O at 12" or greater;

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beatty, L. Cudlip	Date: 6/20/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRB2

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Gleditsia triacanthos	T	FAC	9. Ligustrum vulgare	S	FAC-
2. Fraxinus pennsylvanica	T	FACW	10. Impatiens pallida	H	FACW
3. Crataegus crus-galli	T	FAC	11. Urtica dioica	H	FAC+
4. Toxicodendron vernix	S	FAC+	12. Onoclea sensibilis	H	FACW
5. Vitis riparia	V	FACW-	13.		
6. Toxicodendron radicans	V	FAC+	14.		
7. Menispermum canadense	V	FAC*	15.		
8. Parthenocissus quinquefolia		FAC-	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 10/12 — 83% FAC or FACW or *

Describe Morphological Adaptations:

Remarks: 83% FAC or FACW species

HYDROLOGY

X Recorded Data (Describe in Remarks): X Stream, Lake, or Tide Gage X Aerial Photograph __ Other __ No Recorded Data Available	Wetland Hydrology Indicators: __ Inundated ✓ Saturated in Upper 12 Inches __ Water Marks __ Drift Lines __ Sediment Deposits ✓ Drainage Patterns in Wetlands __ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ____ (in.) Depth to Free Water in Pit: ____ (in.) Depth to Saturated Soil: 12 (in.)	

Remarks: Drainage patterns in wetlands-

PRB2 - WET

SOILS

Map Unit Name: Glendora LS — Drainage Class: poorly drained
Field Observations
Taxonomy (Subgroup): Mixed, mesic Mollic Psammaquents — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A				silty sandy loam
4-12	B				sandy - some clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ✓ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ✓ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Reducing Conditions
Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Upland: Bromus inermis, Poa sp. Achillea millefolium, Daucus carota, Erigeron annuus, Berteroa incana, Plantago lanceolata, Potentilla recta; no H_2O @ 12", 0-12" sandy moist orange-brown

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: _____ Investigator: T. Lee, B. Beatty, L. Cuddip	Date: 6/20/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: PRB2

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Gleditsia triacanthos	T	FAC	9.		
2. Salix nigra	T	OBL	10.		
3. Crataegus crus-galli	T	FAC	11.		
4. Sambucus canadensis	S	FACW-	12.		
5. Cornus amomsum	S	FACW+	13.		
6. Poa palustris	H	FACW+	14.		
7. Phalaris arundinacea	H	FACW+	15.		
8. Urtica dioica	H	FAC+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FAC, FACW or OBL plant species

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: at sfc. (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches
Drainage Patterns in Wetlands

PRB3 - Wet

SOILS

Map Unit Name: Glendora LS Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Mixed, Mesic Mollic Psammaquents Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A	-			clay-sandy loam
4>12	B	-			gravelly sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- X Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

Reducing conditions
Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Upland: same as PRB2 Area

This area is a wetland that meets all 3 criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: _____ Investigator: J. Lee, B. Beatty, L. Cuellio	Date: 6/20/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: PRB4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Platanus occidentalis	T	FACW	9.		
2. Fraxinus pennsylvanicus	T	FACW	10.		
3. Cornus stolonifera	S	FACW	11.		
4. Phalaris arundinacea	H	FACW+	12.		
5. Onoclea sensibilis	H	FACW	13.		
6. Poa palustris	H	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW

Describe Morphological Adaptations:

Remarks: 100% FACW species

HYDROLOGY

X Recorded Data (Describe in Remarks):
- X Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: at sfc (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches
Drainage Patterns in Wetlands

PRB4 - Wet

SOILS

Map Unit Name: Glendora LS — Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Mixed, mesic Mollic Psammaquents — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	B		✓	some	sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ✓ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ✓ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Reducing Conditions
Listed on Local Hydric Soils List

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Upland; same as PRB2 Area

This area meets all 3 wetland criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beatty, L. Cuddy	Date: 6/21/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PLC1

should be OCLC1

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	H	OBL	9.		
2. Impatiens pallida	H	FACW	10.		
3. Eupatorium perfol.	H	FACW	11.		
4. Solidago sp.	H	FACU	12.		
5. Cornus stolonifera	S	FACW	13.		
6. Symplocarpus foetidus	H	OBL	14.		
7. Salix nigra	T	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 85% FACW or OBL

Describe Morphological Adaptations:

Remarks: 85% FACW or OBL.

HYDROLOGY

- [X] Recorded Data (Describe in Remarks):
  - [ ] Stream, Lake, or Tide Gage
  - [X] Aerial Photograph
  - [ ] Other
- [ ] No Recorded Data Available

Field Observations:

- Depth of Surface Water: _____ (in.)
- Depth to Free Water in Pit: _____ (in.)
- Depth to Saturated Soil: 6 (in.)

Wetland Hydrology Indicators:

- [ ] Inundated
- [X] Saturated in Upper 12 Inches
- [ ] Water Marks
- [ ] Drift Lines
- [ ] Sediment Deposits
- [X] Drainage Patterns in Wetlands
- [ ] Oxidized Root Channels in Upper 12 Inches
- [ ] Water-Stained Leaves
- [ ] Local Soil Survey Data
- [ ] Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches
Drainage Patterns in Wetlands

PLC1 should b OCLC1

SOILS

Map Unit Name: _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	B	2.5Y 3/1			gray residue

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Gleyed or Low-Chroma Colors

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Upland: Phalaris arundinacea, Alliaria officinalis Eupatorium, Thalictrum, Fraxinus pennsylvanica, Acer saccharinum Moist only at 18"; gray residue

PLC1 is considered a wetland meeting all 3 criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: I. Lee, B. Beatty, L. Collis	Date: 6/21/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PLC2 — should be OCLC2

This area is not wet - shown at wetland in NWI map UPL

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Thalictrum	Herb	NI	9. Wild geranium G. maculatum	herb	FACU
2. ~~Bl~~ Black medic	Herb	FAC-	10.		
3. Acer negundo	Tree	FACW	11.		
4. Privet - Ligustrum vul.	Shrub	FAC-	12.		
5. Virginia creeper	vine	FAC-	13.		
6. Sycamore	Tree	FACW	14.		
7. Rubus sp.	herb	FACU+	15.		
8. Wild Ginger / Asarum canadense	herb	NI	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. <50%

Describe Morphological Adaptations:

Remarks: Less than 50% wetland species

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- X Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

- Depth of Surface Water: ______ (in.)
- Depth to Free Water in Pit: ______ (in.)
- Depth to Saturated Soil: 7/8 (in.)

Wetland Hydrology Indicators:

- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: somewhat Saturated in upper 12 inches - moist
no indicators present

PLC2 should be OCLC2

SOILS

Map Unit Name: _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A	2.5Y3/3			loam
4-12"	B	5YR5/6			sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Hydric Soils Present?	Yes (No)	Is this Sampling Point Within a Wetland?	Yes (No)
Wetland Hydrology Present?	Yes (No)		

Remarks: Not Wetland contrary to NWI map

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: _____ Investigator: Jim Lee, Brenda Beatty & Lynn Cardiff	Date: 6-22-01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: PRL 9

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo,	T	FACW-	9.		
2. Fraxinus pennsylvanica	T	FACW	10.		
3.			11.		
4. Impatiens pallida	herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW species

Describe Morphological Adaptations:

Remarks: 100% FACW species

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gage
X Aerial Photograph
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

___ Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Other (Explain in Remarks)

Remarks: Saturated soil in upper 12 inches

PRL 9

SOILS

Map Unit Name: Aquents 50 — Drainage Class: very poorly drained

Taxonomy (Subgroup): mixed mesic Aquents — Field Observations: Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A				fine Sand
10-14	B				Sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Meets hydric soil characteristics
Listed on local Hydric Soils List.
Soils are saturated within 12" of the surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Meets wetland criteria for all 3 parameters

Upland area begins at toe of slope
Soils are non hydric - no indicators
no hydrology on slope (upland)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Brenda Beatty & Lynn Cudlip	Date: 6-22-01 County: Allegan State: MICHIGAN
Have vegetation, soils, or hydrology been disturbed? (Yes) (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: 10 Plot ID: PRL 10

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix babylonica	T	FACW	9.		
2. Lythrum salicaria	herb	OBL	10.		
3. Impatiens pallida	herb	FACW	11.		
4. Arctium lappa	herb	UPL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 60 % FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: 60% FACW plant species

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- X Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1-2 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Saturated soils to surface

SOILS

PRL 10

Map Unit Name: Aquents (50) Drainage Class: very poorly drained

Field Observations

Taxonomy (Subgroup): Mixed mesic Aquents Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	Brown			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: soil saturated to surface -

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Hydric Soils Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: All 3 wetland criteria present

Upland area: Prunus virginiana FAC-.
Carya glabra FACU
Carpinus caroliniana FAC
Toxicodendron radicans FAC+

no hydrological indicators; soils have no hydric soil characteristics present.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R.	Date: 6/22/01
Applicant/Owner:	County: Allegan
Investigator: J. Lea, B. Beatty L. Cuillo	State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No)	Community ID:
Is the area a potential Problem Area? Yes (No)	Transect ID:
(If needed, explain on reverse.)	Plot ID: OCRL3

Roll 1, Photo 2 should be OCRC3

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer saccharinum	T	FACW	9.		
2. Acer negundo	T	FACW-	10.		
3. Salix amygdaloides	T	FACW	11.		
4. Phalaris arundinacea	H	FACW+	12.		
5. Carex amomum	S	FACW+	13.		
6. Anemone			14.		
7. Cardamine			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FACW (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 100% FACW

Describe Morphological Adaptations:

Remarks: 100% FACW species present

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- X Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: at sfc (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches

SOILS

Map Unit Name: _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-36	C	5Y3/1			grey ~~residue~~ residual

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: grey residual

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Hydric Soils Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Met all 3 wetland criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beatty, L. Cudlip	Date: 6/22/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: OCRL4

should be OCRC4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	H	FACW+	9.		
2. Impatiens pallida	H	FACW	10.		
3. Acer negundo	T	FACW-	11.		
4. Urtica dioica	H	FAC+	12.		
5. Acer saccharinum	T	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW

Describe Morphological Adaptations:

Remarks: 100% FACW species

HYDROLOGY

X Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gage X Aerial Photograph __ Other __ No Recorded Data Available	Wetland Hydrology Indicators: __ Inundated X Saturated in Upper 12 Inches __ Water Marks __ Drift Lines __ Sediment Deposits X Drainage Patterns in Wetlands __ Oxidized Root Channels in Upper 12 Inches __ Water-Stained Leaves __ Local Soil Survey Data __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ____ (in.) Depth to Free Water in Pit: ____ (in.) Depth to Saturated Soil: at sfc (in.)	

Remarks:

SOILS

OCRL4

Map Unit Name: _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
12	B-	5Y3/1			gray residue

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: gray residue

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Hydric Soils Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Met all 3 wetland Criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: _____ Investigator: J. Lee, B. Beatty, L. Cuddy	Date: 6/22/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: OCRL6 (should be OCRC6) OCRL5

Roll 1, Photo 1

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	H	FACW+	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100%

Describe Morphological Adaptations:

Remarks: monoculture on grey residue
100% FACW species

HYDROLOGY

Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- X Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: at sfc (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- X Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: moist only at 14" → 16"; sat - 0-12"

SOILS

OCRL6 + OCRL5

Map Unit Name: _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-14		10YR 3/1			
14-16		5Y 3/1	5Y 4/6	some	

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on Hydric Soils List

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: Met all 3 wetland criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beatty, L. Cuellip	Date: 6/20/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRB5 PRB6

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Platanus occidentalis	T	FACW	9. Onoclea sensibilis	H	FACW
2. ~~Fraxinus nigra~~	T		10.		
3. Fraxinus pennsylvanica	T	FACW	11.		
4. Cornus amomsum	S	FACW+	12.		
5. Rosa multiflora	S	FACU	13.		
6. Toxicodendron radicans	H	FAC+	14.		
7. Menispermum canadense	H	FAC*	15.		
8. Phalaris arundinacea		FACW+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC or FACW

Describe Morphological Adaptations:

Remarks: 100% FAC or FACW Species

HYDROLOGY

- [X] Recorded Data (Describe in Remarks):
  - [X] Stream, Lake, or Tide Gage
  - [ ] Aerial Photograph
  - [ ] Other
- [ ] No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: at sfc (in.)

Wetland Hydrology Indicators:

- [ ] Inundated
- [X] Saturated in Upper 12 Inches
- [ ] Water Marks
- [ ] Drift Lines
- [ ] Sediment Deposits
- [X] Drainage Patterns in Wetlands
- [ ] Oxidized Root Channels in Upper 12 Inches
- [ ] Water-Stained Leaves
- [ ] Local Soil Survey Data
- [ ] Other (Explain in Remarks)

Remarks: Saturated in upper 12 inches
Drainage Patterns in Wetlands

PRB5 - Wet
PRB6 Wet

SOILS

Map Unit Name: Glendora LS — Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Mixed mesic Mollic Psammaquents — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	B			some	sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils same as PRB4

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks: Upland - same as 4 Area

This area meets all 3 wetland criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beatty, L. Cordlip	Date: 6/20/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: PRB7 PRB8

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. no vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: open water - some vegetation on log debris - grasses

HYDROLOGY

X Recorded Data (Describe in Remarks):
- X Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2-3' (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- X Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: open water

PRB7 - Wet
PRB8 - Wet

SOILS

Map Unit Name: _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: open water - soil pit not dug.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ✓Yes No (Circle)
Hydric Soils Present? ✓Yes No
Wetland Hydrology Present? ✓Yes No

(Circle)
Is this Sampling Point Within a Wetland? ✓Yes No

Remarks: Uplands: Quercus alba, Q. rubra, Prunus serotina, Acer rubrum seedlings, Parthenocissus quinquefolia; - terrace 75' feet upslope from open water.

Upland: PRB8. Quercus alba, Q rubra, Ulmus rubra, Area: Saponaria officinale, Bromis inermis, Melilotus alba, Toxicodendron radicans, Equisetum arvense, Hypericum perfoliatum, Rhus typhosa, knapweed.

Hydrology + Soils - same PRB8

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: R Brady	Date: 6/22/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PEM Transect ID: OCLB3 Plot ID: GPS

N 42. 456 86°
W 085 . 733 60

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	H	FACW+	9.		
2. Lythrum salicaria	H	OBL	10.		
3. Impatiens pallida	H	FACW	11.		
4. Sagittaria	H	OBL	12.		
5. Salix nigra	T	OBL	13.		
6. Fraxinus pennsylvanica	T	FACW	14.		
7. Typha latifolia		OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100 % FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FACW or OBL

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other X No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated X Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: 21 (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: standingwater in wet meadows

SOILS

Map Unit Name: Sloan — Drainage Class: Very poor hydrained
Field Observations
Taxonomy (Subgroup): Fine loamy mixed mesic Fluvaquentic Hapla quolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4		10YR 2/1			silty w/organic matter
6-22		gley	none		grey residual matter

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ✓ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ✓ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Reducing conditions
Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: This area was classified as upland on NWI map, field verification demonstrates this area is a wetland.

Upland area is at toe of slope by Jefferson St.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Brenda Beatty	Date: 6-23-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: Plot ID: Prb5 to Prb8

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Am Hop -	Tree	FAC	9.		
2. Beech	Tree	FAC	10.		
3. Pinus strobus	Tree	UPL	11.		
4. Ash	Tree	UPL	12.		
5. Asplenium platyneuron	herb	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 20% FAC

Describe Morphological Adaptations:

Remarks: less than 20% FAC species

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: no wetland hydrological indicators present above the seasonal high water line of the river

SOILS

Prb 5 to Prb8

Map Unit Name: _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: no hydric soils indicators were present above the seasonal high water line of the steep riverbank.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)

Hydric Soils Present? Yes (No)

Wetland Hydrology Present? Yes (No)

(Circle)

Is this Sampling Point Within a Wetland? Yes (No)

Remarks: These areas are uplands except at the water's edge of the river. There are steep slopes along this reach of the river.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo R. Applicant/Owner: Investigator: J. Lee, B. Beaty, L. Cudlip	Date: 6/23/01 County: Allegan State: MI
Have vegetation, soils, or hydrology been disturbed? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: OCRC7

Roll 1, Photo 3

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lythrum salicaria	H	OBL	9.		
2. Alliaria officinalis	H	FAC	10.		
3. Salix nigra	T	OBL	11.		
4. Typha angustifolia	H	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 100%

Describe Morphological Adaptations:

Remarks: 100% FAC or OBL species.

HYDROLOGY

X Recorded Data (Describe in Remarks): X Stream, Lake, or Tide Gage X Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated X Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: 5 (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: inundated during peak flow - NWI map shows this as unconsolidated bottom - Emergent later in season

OCRC 7

SOILS

Map Unit Name: _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A/B	10YR2/1			loam
10->30"	B	5Y3/1	5YR4/6	some	grey residue

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ *Sulfidic Odor*
- ___ Probable Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ *Organic Streaking*
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Recorded this point to show that wetlands in this area are inundated during peak flows or flood events & exposed latter. Also documents abundance of purple Loosestrife in the river channel area, met all 3 wetland criteria

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee ; Justin Woods	Date: 6/23/01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PEM Transect ID: 5 to 8 Plot ID: Pr15 to Pr18

12th ST. LANDFILL AREA

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	herb	OBL	9.		
2. Impatiens pallida	herb	FACW	10.		
3. Phalaris arundinacea	herb	FACW+	11.		
4. Acer negundo	Tree	FACW	12.		
5. Urtica dioica	herb	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FACW or OBL plant species present.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Soils saturated to surface.

Pr1-5 to Pr1-8

SOILS

Map Unit Name: Aquents 50 Drainage Class: very poorly drained
Field Observations
Taxonomy (Subgroup): ... classified as Confirm Mapped Type? (Yes) No
mixed mesic Aquents

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8"	A	Grey residual			Grey residual clayey w/ course sand
8-12"	E	Brown			Gravel w/ sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: soil saturated to surface at these plots. Listed on local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: All 3 wetland criteria met.

Upland area is the steep slope adjacent the wetland. The upland line is well defined and reflect upland trees and shrubs. Soils have upland characteristics - no hydric soils.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalama zoo River Applicant/Owner: Investigator: Jim Lee, Jennifer Harness	Date: 6-25-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: Plot ID: ORL-3

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9. Rubus sp.	herb	FAC
2. A. saccharinum	Tree	FACW	10. Phalaris arundinacea	herb	FACW+
3. Populus deltoides	Tree	FAC+	11. Alliaria officinalis	herb	FAC
4. Acer negundo	Tree	FACW	12. Urtica dioica	herb	FAC+
5. Crataegus rusgalli	Shrub	FAC	13.		
6. Cornus stolonifera	shrub	FACW	14.		
7. Viburnum lentago	herb	FAC+	15.		
8. Solidago caesia	herb	FACU	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 90-100% FAC, FACW species

Describe Morphological Adaptations:

Remarks: 90 to 100% of the species are Facultative or Fac Wet.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gage
___ Aerial Photograph
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: > 18 (in.)

Wetland Hydrology Indicators:

___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
X Drainage Patterns in Wetlands
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
X Local Soil Survey Data
___ Other (Explain in Remarks)

Remarks: Local Soil Survey data was used

ORL-3

SOILS

Map Unit Name: Sloan 62 — Drainage Class: very poorly drained

Field Observations

Taxonomy (Subgroup): Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10"	A	10YR 3/2			fine sand
10-15"	Ab	10YR 4/2			loamy sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on local Hydric Soils List

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)	(Circle)	
Hydric Soils Present?	(Yes)	No		
Wetland Hydrology Present?	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks: All three wetland criteria present

Upland area does not have drainage flow ways
soils have non-hydric soil characteristics
most plant species are mixed with FAC and FACUP indicators.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Jennifer Harness	Date: 6-25-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: Plot ID: ORL 4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix sp.	Tree	OBL	9.		
2. Phalaris arundinacea	herb	FACW+	10.		
3. Acer negundo	Tree	FACW-	11.		
4. Urtica dioica	herb	FAC+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 80% plant species are FAC, FACW or OBL.

Describe Morphological Adaptations:

Remarks: Meets vegetative wetland criteria.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: some drainage flow ways through this area.

ORL-4

SOILS

Map Unit Name: Sloan 62 — Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Fine-loamy, mixed, mesic, Fluvaquentic Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-15"	A				gray residual

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: gray residual paper waste was not moist but dry to 15 inches. Weak wetland soil indicator at this site

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Hydric Soils Present? Yes (No)

Wetland Hydrology Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks: Wetland indicators are very weak, especially soils and hydrology indicators

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Jennifer Harness	Date: 6-25-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: 11 Plot ID: OSR 11-4

(4 stations upland)

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo	Tree	FACW	9.		
2. Populus deltoides	Tree	FAC+	10.		
3. Rosa multiflora	herb	FACU	11.		
4. Urtica dioica	herb	FAC+	12.		
5. Alliaria officinalis	herb	FAC	13.		
6. Solidago caesia	herb	FACU	14.		
7. Vitis labrusca	vine	FACU	15.		
8. Phalaris arundinacea	herb	FACW+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 40% FAC or FACW

Describe Morphological Adaptations:

Remarks: 40% FAC or FAC W species. This area is in transition with dense upland species colonizing.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ✓ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: >18 (in.)	

Remarks: No hydrological indicators present. Several isolated drainage flow ways prevent adjacent upland to receive surface run off from slopes.

SOILS

Osr1-1 to Osr1-4

Map Unit Name: Sloan 62 — Drainage Class: very poorly drained
Field Observations

Taxonomy (Subgroup): Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A	Grey			Grey residual
10-12	E	Brown			sand w/ clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: No saturated soils within the upper 12" of the surface. Listed as hydric soils

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks: Sampling plots Osr1-1, Osr1-2, Osr1-3 and Osr1-4 are considered uplands. MWI map will be changed to reflect uplands.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee ; Justin Woods	Date: 6/26/01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: 2 Plot ID: TLL2

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9.		
2. Acer saccharinum	Tree	FACW	10.		
3. Cornus stolonifera	Shrub	FACW	11.		
4. Onoclea sensibilis	Herb	FACW	12.		
5. Toxicodendron radicans	vine	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC or FACW

Describe Morphological Adaptations:

Remarks: 100% FAC or FACW species along the bank.

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches X Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: 0 (in.)	

Remarks: Strong hydrological indicators which include water marks and drainage patterns

TLL2

SOILS

Map Unit Name: Oakville 10E — Drainage Class: Moderately well Drained

Field Observations

Taxonomy (Subgroup): Mixed, mesic Typic Udipsamments — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	B	10YR 3/2			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: soils are listed on local Hydric soils List. soils are moist along bank

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: All 3 wetland criteria are met.

For the upland sample dominant tree is the Pine with Asimina triloba and

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee	Date: 6/26/01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: Plot ID: TL3

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negunda	Tree	FACW-	9.		
2. Acer rubrum	Tree	FAC	10.		
3. Salix nigra	Shrub	OBL	11.		
4. Phalaris arundinacea	herb	FACW-	12.		
5. Toxicodendron radicans	Vine	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 100% FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FAC, FACW or OBL species present along the bank.

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches X Water Marks X Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: Drift lines and water marks present along bank.

TLL3

SOILS

Map Unit Name: Cohoctah 29 — Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Coarse-loamy, mixed mesic Fluvaquentic Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12"	A	10YR 3/2			Sand
12+8"	E	10YR 4/1			Sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on local Hydric Soils List

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	(Circle)	
Hydric Soils Present?	(Yes)	No		(Circle)
Wetland Hydrology Present?	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks: All 3 wetland criteria met

upland species include Acer rubrum, Galium aparine, Arctium lappa, and Crataegus crus-galli. no hydrological indicators present in the upland slope. No hydric soil characteristics present in the upland slope.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Justin Woods	Date: 6-26-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FO Transect ID: 04 Plot ID: TLL-4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9. Toxicodendron radicans	vine	FAC+
2. Acer saccharum	Tree	FACW	10. Iris versicolor	herb	OBL
3. Cornus sp.	Tree	FACW	11.		
4. Fraxinus pennsylvanica	Tree	FACW	12.		
5. Phalaris arundinacea	herb	FACW+	13.		
6. Arcticum lappe	herb	UPL	14.		
7. Sagittaria sp.	herb	OBL	15.		
8. Saururus cernuus	herb	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 90% of the species are FACW or OBL

Describe Morphological Adaptations:

Remarks: 90% of the plants are FACW or OBL.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: 3 (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ✓ Water Marks
- ✓ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ✓ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Hydrological indicators include water marks, drift lines and water-stained leaves.

TLL 4

SOILS

Map Unit Name: Cohoctah (29) Drainage Class: poorly drained
Field Observations
Taxonomy (Subgroup): Coarse-loamy, mixed, mesic Fluvaquents Confirm Mapped Type? (Yes) No
Haplaquolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-5	A	10YR 3/2			fine sand
5-18	E	10YR 3/2			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Hydric soil indicators include Listed on local Hydric Soils List, Soils saturated within 3-6" of the surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: All 3 wetland indicators present at this site.

Upland: soils 0-8" 10YR 4/2
8-15" 10YR 5/4

no hydrological indicators above S.H.W.L. The river has a steep slope at this point adjacend the oxbow/island.

Acer rubrum - FAC
Parthenocissus quinquefolia FAC-
Pinus strobus - UPL
Geranium maculatum - FACU
Asimina triloba - FAC

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Justin Woods	Date: 7-6-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: Herb/F Transect ID: ORL Plot ID:

wetland.

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9.		
2. Phalaris grundinacea	herb	FACW*	10.		
3. Urtica dioica	herb	FAC+	11.		
4. Ulmus americana	Tree	FACW-	12.		
5. Toxicodendron radicans	Vine	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 80% FAC, FACW.

Describe Morphological Adaptations:

Remarks: 80% Fac or Facw - plant species.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gage
___ Aerial Photograph
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

___ Inundated
___ Saturated in Upper 12 Inches
X Water Marks
X Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Other (Explain in Remarks)

Remarks: Water marks
Drift lines.

ORCI

SOILS

Map Unit Name: Brady — Drainage Class: somewhat poorly drained

Taxonomy (Subgroup): Aquollic Hapludalfs — Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10YR 4/3			fine sand
8-16	A6	10YR 5/6			sand w/ Clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- ✓ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Hydric soil conditions of saturated soils to surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: All three wetland criteria are met.

Upland area consist of sassafras, Elm and Burdock. Water table greater than 19", soils dry with no hydric characteristic conditions present.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Justin Woods	Date: 7-8-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Transect ID: Plot ID: ORL-2

Seep area

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer negundo.	Tree	FACW	9.		
2. Ulmus americana	Tree	FACW-	10.		
3. Arctium lappa	herb	UPL	11.		
4. Phalaris arundinacea	herb	FACW+	12.		
5. Onoclea sensibilis	herb	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 80% FACW

Describe Morphological Adaptations:

Remarks: 80% FAC W species present

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ✓ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Sediment deposits from runoff
saturated soils in upper 12 inches of surface

SOILS

Map Unit Name: Brady 19A Drainage Class: somewhat poorly drained

Field Observations

Taxonomy (Subgroup): Coarse-loamy mixed mesic Aquollic Hapludalfs Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-1"	A	10YR 2/1			organic sandy soil
1-12"	E	10YR 3/2			sandy soils

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: soils are perched on a shelf where runoff is ponded soils are saturated to surface most of the year.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No (Circle)		(Circle)
Hydric Soils Present?	(Yes) No		
Wetland Hydrology Present?	(Yes) No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks: All 3 wetland criteria are met.

Upland area rises sharply with upland dominated specie (sassafras, pinus, Asimina). no hydrological indicators present. sandy soils - dry >18"

SOILS

PORL 1

Map Unit Name: Urban land (Ug) Glendora Drainage Class: very poorly drained

Field Observations

Taxonomy (Subgroup): (mitigation site) Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	10YR 3/1			fine sand
2-10"	E	10YR 4/3			fine sand, pebbles

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on local Hydric Soils List. Soils saturated to within 4" of the surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Hydric Soils Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: All 3 wetland parameters present.

Upland area is located at toe of slope. Tree seedlings are beginning to colonize: Acer rubrum & Populus, Erigeron annuus, Solidago Caesia and Setaria sp. Soils dry with no hydric soil characteristics present at upland pit.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Allied Paper Inc out Applicant/Owner: _____ Investigator: Jim Lee, Murray Wade, Justin Woods	Date: 7-9-01 County: Kalamazoo State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Herb Transect ID: PORL2 Plot ID: wetland

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Populus deltoides	Tree	FACt	9.		
2. Juncus effus	herb	OBL	10.		
3. Phalaris arundinac	herb	FACW+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FAC, FACW or OBL plant species.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other X No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches X Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ✓ ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: 0 (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: Stain Marks along Culvert show high water mark - ≈ 18" above existing water level.

POR L2

SOILS

Map Unit Name: Urban land-Glendora (Ug) Drainage Class: Very poorly Drained

Taxonomy (Subgroup): N/A Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	10YR 3/2			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on Local Hydric Soils List
Soils saturated within 12" of the surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: All 3 wetland criteria met.

Upland begins at slope that is grassed, along with Trifolium aureum - upl.
no hydrological indicators present; soils dry with no hydric soil indicators.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River - Portage Creek Applicant/Owner: Investigator: Jim Lee, Murray Wade, Justin Woods	Date: 7-9-01 County: Kalamazoo State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Herb Transect ID: 03 Plot ID: POR-3

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	herb	OBL	9.		
2. Carex sp.	herb	OBL	10.		
3. Juncus effusus	herb	OBL	11.		
4. Impatiens pallida	herb	FACW	12.		
5. Rumex crispus	herb	FAC+	13.		
6. Salix sp (seedlings)	Tree	OBL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FAC, FACW and OBL

Describe Morphological Adaptations:

Remarks: 100% FAC, FACW and OBL species present

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ✓ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ✓ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: 2 (in.)	

Remarks: Recorded data present upstream; saturated soils in upper 12 inches and local soil survey data indicates hydrology is present.

POR-3

SOILS

Map Unit Name: Urban land (Ug) Glendora Drainage Class: very poorly drained

Taxonomy (Subgroup): N/A Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10"	A	10 YR 3/2			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on Local Hydric Soils List.
Soils saturated in upper 12" of the surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)	(Circle)
Hydric Soils Present?	(Yes)	No	
Wetland Hydrology Present?	(Yes)	No	Is this Sampling Point Within a Wetland? (Yes) No

Remarks: All three wetland parameters present,
This area is considered a wetland.

The upland area starts along the slope of the bank. There is some seepage along the slope causing the soils to be saturated. Upland of this point is considered upland with no hydrological indicators, no hydric soils and upland plants.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

04-1

Project/Site: Kalamazoo River - Portage Creek Applicant/Owner: Investigator: Jim Lee, Murray Wade, Justin Woods	Date: 7-9-01 County: Kalamazoo State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: HERB Transect ID: 01 Plot ID: POR-1

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus effusus	Herb	OBL	9.		
2. Lythrum salicaria	Herb	OBL	10.		
3. Phalaris arundinaria	Herb	FACW+	11.		
4. Carex valpinoidea	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW or OBL species

Describe Morphological Adaptations:

Remarks: 100% FACW or OBL plant species present

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated ___ Saturated in Upper 12 Inches X Water Marks X Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves X Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: 4 (in.)	

Remarks: Hydrological indicators include water marks, drift lines, Drainage patterns in wetlands, and local soil survey data.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River - Portage Creek Applicant/Owner: Investigator: Jim Lee, Murray Wade, Justin Woods	Date: 7-9-01 County: Kalamazoo State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FO Transect ID: 04 Plot ID: POR-4

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Symphoricarpus arbiculatus	Shrub	FACU	9. Rosa multiflora	herb	FACU
2. Acer rubrum	Tree	FAC	10. Parthenocissus quinquefolia	Vine	FAC-
3. Acer negundo	Tree	FACW	11. Vitis labrusca	vine	FACU
4. Cornus sp.	Tree	FACW	12.		
5. Fagus grandifolia	Tree	FACU	13.		
6. Fraxinus pennsylvania	Tree	FACW	14.		
7. Prunus virginiana	Tree	FAC-	15.		
8. Salix nigra	Tree	OBL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 80% FAC, FACW or OBL

Describe Morphological Adaptations:

Remarks: 80% of the species are FAC, FACW or OBL.

HYDROLOGY

- ✓ Recorded Data (Describe in Remarks):
  - ___ Stream, Lake, or Tide Gage
  - ___ Aerial Photograph
  - ___ Other
- ___ No Recorded Data Available

Field Observations:

- Depth of Surface Water: _____ (in.)
- Depth to Free Water in Pit: _____ (in.)
- Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ✓ Water Marks
- ✓ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ✓ Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Hydrological indicators include: Saturated soils in upper 12 inches of surface; water marks, drift lines, and local soil survey data.

SOILS

POR-4

Map Unit Name: Urban land (Ug)-Glendora Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): n/a Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-1	A	10YR 3/2			fine sand
1-10	E	10YR 9/2			fine sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on local Hydric Soils List.
Soils saturated within 12" of surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: All 3 wetland indicators present.

Upland area is top of bank. A mix of upland and wetland trees on slope. Seasonal high water marks of staff gage is within 2' of existing surface. Bank is about 6-10' high.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Murray Wade, Justin Woods	Date: 7-10-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: herb. Transect ID: OCR1 Plot ID:

Garden Area

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	herb	FACW+	9.		
2. Acer negundo	Tree	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 100% FACW

Describe Morphological Adaptations:

Remarks: 100% species FACW

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gage
___ Aerial Photograph
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
X ___ Drainage Patterns in Wetlands
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Other (Explain in Remarks)

Remarks: During seasonal high water from events or snow melt, dual area is saturated.

SOILS

ORC-1

Map Unit Name: Sloan Series — Drainage Class: Very Poorly Drained

Field Observations

Taxonomy (Subgroup): Fine loamy mixed mesic Fluvaquentic Haplaquolls — Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12"	A	10YR 4/2			fine sand
12-32	B	residual			Clay ~~clay~~

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on Local Hydric Soil List

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: All three wetland parameters met along bank of Kalamalau River.

The upland area is along the bank (TWB) The garden area contains more than 50% cultivated species. The water table is greater than 27", soils to that level are residual.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: Jim Lee, Murray Wade, Justin Wade	Date: 7-11-01 County: Kalamazoo State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FO Transect ID: Plot ID: ORL-7

Wetland - 7

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	Tree	OBL	9.		
2. Acer negundo	Tree	FACW-	10.		
3. Rosa palustris	herb	OBL	11.		
4. Cornus sp.	Shrub	FACW	12.		
5. Urtica dioica	herb	FAC+	13.		
6. Solidago caesia	herb	FACU	14.		
7. Phalaris arundaia	herb	FACW	15.		
8. Impatiens pallida	herb	FACW	16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands: 100% FACW or OBL

Describe Morphological Adaptations:

Remarks: 100% FAC W or OBL plant species, with some FAC species.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gage
- ___ Aerial Photograph
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: >18 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- V Drainage Patterns in Wetlands
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- V Local Soil Survey Data
- ___ Other (Explain in Remarks)

Remarks: Drainage patterns present within sample area.

ORL-7

SOILS

Map Unit Name: Sloan — Drainage Class: Very Poorly Drained
Field Observations
Taxonomy (Subgroup): Fine Loamy, Mixed Mesic — Confirm Mapped Type? (Yes) No

Profile Description: Fluvaquentic Haplaquolls -

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A	10YR 5/3			Grandelon sand
10-18	B	10YR 4/2			Sand.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks: Met all 3 Wetland parameters -

upland area - no hydric soils and no hydrological characteristics - 100% FACW sp. present. with FAC species, including Gleditsea tricanthos - FAC.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kalamazoo River Applicant/Owner: Investigator: JIM LEE, JUSTIN WOODS	Date: 6-26-01 County: Allegan State: Michigan
Have vegetation, soils, or hydrology been disturbed? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: PFO Transect ID: 01 Plot ID: TL1

VEGETATION (Note those species observed to have morphological adaptations to wetlands with a *)

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix nigra	Tree	OBL	9.		
2. Typha angustifolia	herb	OBL	10.		
3. Acer negundo	Tree	FACW-	11.		
4. Phalaris arundinacea	herb	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. 100% FACW or wetter

Describe Morphological Adaptations:

Remarks: 100% of the dominate plant species are FACW or wetter.

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gage ___ Aerial Photograph ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: ___ Inundated X Saturated in Upper 12 Inches X Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: 0 (in.)	

Remarks: Hydrolgical indicators include Saturated soils in upper 12 inches of the surface, Water marks on tree trunks.

TLL1

SOILS

Map Unit Name: Algansee (73A) Drainage Class: Rapidly Permeable
Field Observations
Taxonomy (Subgroup): Mixed mesic Aquic Udipsamments Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10 YR 7/1			Dk Grey - med to course Sand
8-12	b	10 YR 4/2			Sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Probable Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer
- ___ Organic Streaking
- X Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Met hydric soil characteristics
Listed on Local Hydric Soils List.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Hydric Soils Present? (Yes) No
Wetland Hydrology Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks: Met wetland characteristics

Upland area is approximately 30' from shore where Pinus strobus dominate. Asimina triloba and Sassafras albidum occur in this sample plot. No hydrological indicators present. Upland soils characteristics are present.


Appendix
B

CONTENTS

PAGE NO.	REFERENCE	DATE

6-20

Net 2KM
start at site 9:00

Jim Lee
B Beatty
Lynn Cudlip
Jennifer Harness
Justin Woods

objective: Wetland Delineation
Kalamazoo River
at Plainwell Dam.
going toward Otsego

PB/BB - Numbering system Plainwell to ~~Otsego~~ BB

Facing downstream left, right bank L, R, initial, Numb

PRB 1 → consecutive No

↑
my initial

DD 6/20/01

pit area where doing gps - every 10 - 15 flags.

DD 6/20/01

PRB1 - GPS reading, turtle swimming offshore just downstream levee wetland

pts: reed canary grass - purple loosestrife, buttonbush, Cornus stolonifera

Black Willow - Honey locust,

upland area just upstream of GPS pt.

wet pond - soil saturated at surface, sandy gravelly 12" deep, saturated

DD

BB 6/20/01

upland area

Poa — black medic

P. ivy — Daucus carota

Solidago

Crataegus

G. triacanthos

prickly ash

sycamore

1st 4 inches sandy loam, fairly moist

4-12" fine sand w/ gravel

No H_2O at 12"

BB 6/20/01

BB 6/20/01

Heading back up road

wet follows road on left side

Acer saccharinum

Platanus occidentalis

green ash

coralberry (on slope & lower)

Salix amygdaloides? (red young stems, petioles)

frog (heard - banjo string)

2/3 way up road, open field to left, break in topog. ↑

GPS point -

slight topo gradient goes up, wet toward river, upl away from river

BB 6/20/01

BB 6/20/01

wet.
0-4" silty sand loam
4-12" Saturated at 12"
sand soil, little clay.
no real organic streaking
Saturated at 12"

Veg:
Honeylocust
grape
privy
mowing
Vaccinium
sensitive fern
Urtica dioica
jewelweed
green ash
silky dogwood
privet
poison sumac
Crataegus crus galli

BB 6/20/01

BB 6/20/01
upland
0-12" sandy moist
orange/brown color
- ie no water at 12"

smooth brome
Poa sp.
daisy fleabane
Achillea millefolium
Daucus carota
canadathistle
English plaintain
Potentilla pale yellow

BB
6/20/01

PRB 3 BB 6/20/01

carex looking
Poa palustris - understory like
Cornus
Urtica dioica
Sambucus canadensis
Honey locust
black willow
Reed canary grass
Crataegus

Soil saturated at surface
0-4" clay sandy loam
4 to 12" gravelly sandy clay
mottling (saturated)

upland - same as pt # 2

Common yellowthroat
red winged blackbird

red-tailed hawk
(top predator

BB 6/20/01

by pond -
frogs (bango study)
PRB3a - opening to large upland area
took GPS reading only.

PRB 4 - wet
sensitive fern
Cornus stolonifera
~~Poa~~ Reed Canary grass
sycamore
green ash
Poa palustris

Soil saturated at surface
0-12" sandy clay
some mottling

upland - same as
pt 2

small pond towards S. end
of open field
bluegill
black horiz stripe
" on tail
No frogs seen

BB 6/20/01

PRB5

wet.

Dogwood understory
P. ivy
Sensitive fern
moon vine
green ash
Sycamore
multiflora rose
Reed canary grass

soil same as 4

Acadian flycatcher

upl same as 4

BB 6/20/01

BB 6/20/01

PRB6
similar to 5

PRB 6a
opening to large upland area.
as coming back out to North /East.

GPS pt, only.

PRB 7
open water
unconsolidated bottom

upland location -
steep topo gradient 75' down to bottom of slope.

BB 6/20/01

white oak
red oak

understory wild blk cherry

blackberry
Va creeper
red maple seedlings

PRB 8
steep topo gradient
from open water
Distributary channel
(braided part of stream)

BB 6/20/01

where RR intersects Rd

BB 6/20/01

upland veg.

white oaks
red oak
Elm. slippery
bouncing bet
smooth brome
BB yel / wh sweet clover.
p. 107
equisetum arvense
Knapweed
staghorn sumac Rhus typhina
St Johns wort

BB 6/20/01

6/21/01 $ Beatty

Overcast, Cool 60°
Team: Beatty, Andrew Santini

Objective: wetland delineation
Kalamazoo River

Arrive at site 0800

Start at Park.

1st GPS reading

BB
GT
PLB1 (renamed to OCLB1 - otsego city)
Lat 42.45608°
Lon -85.68647
Acc: 28.2'

On sdsel 40 @ corner of wetlands
near beach w/ private property sign - took
GPS OCLB2
lat 42.46012°
Lon -85.68875°
Acc -25

Beatty 6/21/01

Wet Vegetation
- Black willow, Silver Maple, Box Elder
Staghorn Sumac (toe of slope)
grapevine, Reed Canary Grass,
Virginia Creeper, stinging nettle

Soil
- 0-12" silty sand, (#6" roots),
moist, sat. @ 14"
re-visited in PM
@ OCLB2 rained all day - soil saturated at surface

Upland - No soil sample taken on
private property
Vegetation - Red bud, wild black cherry,
No trees (in floodplain) raspberry
orchard grass, grape vine, bearing
bet, Virginia creeper, slender
wheat grass, staghorn sumac,
poke weed

Finished at North St Bridge

Walked area from park
to N. Street Bridge.

6/21/01 [signature]

For most part steep topographic gradient wetland boundary at toe of slope.

& 1 end near water to 1' above water's edge. In some areas this formed a floodplain terrace. In general, wetlands were a narrow strip along edge of water & agreed w/ NWI map.

Wetland strips had Loosestrife Carex, Black Willow Reed Canary Grass.

"Upper" areas up to 5' above water surface.

6/21/01 [signature]

Veg at terrace. areas had white oak, sugar maple.

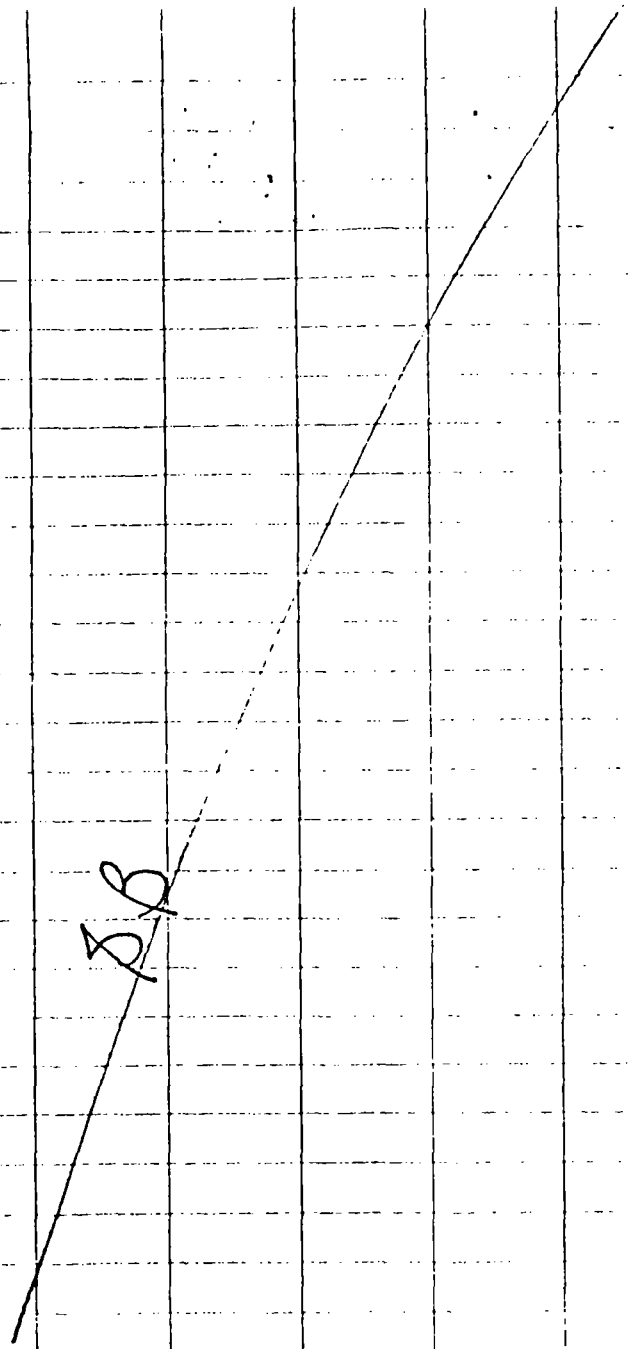
[initials]

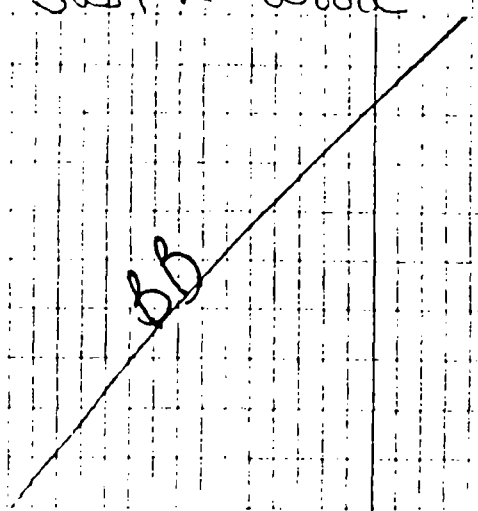
6/22/01 B Beatty

Met team at 7:30
drove to boat launch site.
Working area downstream
of Otsego City Dam

objective: Wetlands
delineation along Kalamazoo
River.

B Beatty
L. Cuddy
Jim Lee
Jay Zawacki
Justin Wood





D= Dominant

6/22/01 BBeatty

~~1st point~~
headed directly west of road where we launched boat. Confirms map indication of wetland

Wetland Veg
Phalaris arundinacea, P. lanceolata, ...
Sagittaria, black willow, green ash, Typha latifolia
Sambucus canadensis, silver maple (edge)

Hydro: standing water.

Soil: top 4 inches
Silty, lots of organic matter 10YR 2/1
6 to 12" gray residual matter 1st pg 2nd from bottom
No mottling

6/22/01 BBeatty
GPS point OCLB3
N 42.45686°
W 085.73360°

Transition zone Veg
Solidago
Coral berry
Vitis riparia
Elderberry
steep topo gradient up to road
Roadside veg & fill for road. large lake to south

Did not check soil since fill.

Veg at top of ridge is Smooth Brome, Daucus carota, curly dock, yel. sweet clover, knapweed, large milkweed, boundary bed

6/22/01 B Beatty

Walked into upland as marked on map -
green ash, box elder, garlic mustard - wild black cherry, bitternut hickory.

as approach river, topo gradient drops, step along river ~ 60' wide has wetland veg

Took point here
OCLB4 N 42.45875°
W 083.74075°

as topo gradient goes up, trees at edge, drift lines of buttressed tree trunks or soil eroded from long roots at base of tree.
Skunk cabbage up to this elevation
Trees primarily box elder, silver maple.

6/22/01 B Beatty

wetland veg is Phalaris arundinacea, Impatiens, ... from trees to river

Soil - gley pg. 1st pg 2nd from bott.
0 to 10" grey residuum
10 to 14" silty ~~clay~~ + very fine sand
gray residuum
mottles, streaking 7.5 YR 5/
Soil moist, but not saturated
Walked 10' towards river and soil is saturated at surface. topo drop of ~ 2'
still wetland veg

check indicator status of following
mayapple
wild ginger (has skunk cabbage ... - mixed)
jack in pulpit
raspberry

6/22/01 B Beatty

some wetland plants could be in this area due to water holding capacity of soil, w/ gray residuum.

this part of shoreline about 750' from shore is wetland. Then gentle slope w/ transition line of veg leading to upland.

Photo 1 & Photo 2 show wetland stretch along shore-line, & further to left where bank at river is the cutoff delineation line.

BB

6/23/01 Beatty, Cude, ?, Lee

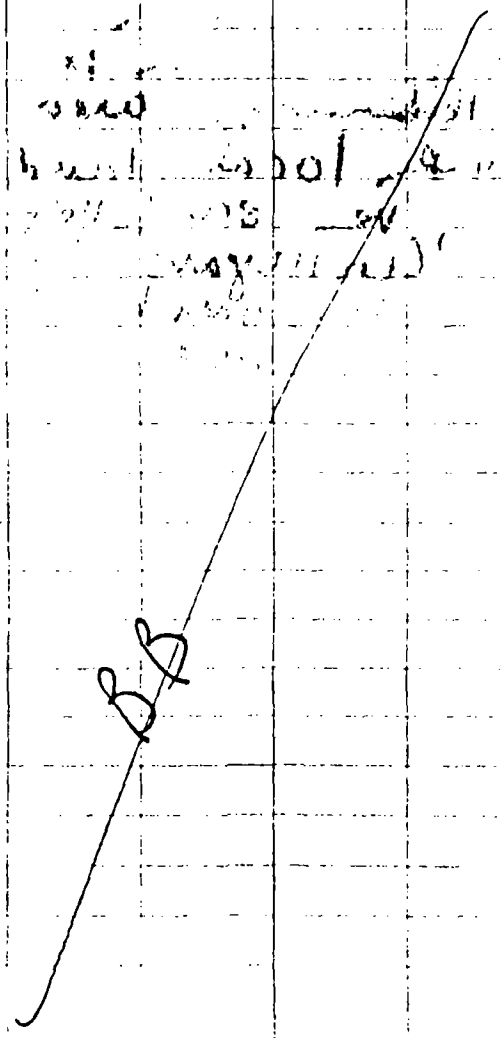
Met team 7:30 - drove to meet Quaglia at 8:00
obj: wetlands delineation Kalamazoo Riv.
drove to stretch of river that was not completed yesterday. Just off the road that goes to B. [illegible] ski area.
Met with local land owner. He said he's never (in 11 years) seen water come over bank on this side of river.

Confirmed that toe of bank is upland side of wetland. Narrow strip of wetlands along river bank. Therefore upland strip on map along river edge was determined to be wetlands. downstream.

Walked from that point to GPS station that was taken 6/22 to finish the line.

BB 6/23/01

Continued driving river road to ground truth NWI maps.
See notes on map



BB 6/23/01

stopped by Trobridge Dam for lunch.
Steamgage here -
current water ht: 1.28
high water mark 1.58

PM
BB Beattay & Jay Bawacki walk tributary just upstream of Trobridge dam, to south.

Most of NWI lines matched field conditions.
Steep topographic line for most area - wetlands (emergent) as indicated on maps.
Wetland veg incl. Typha, Phalaris, Urtica dioica, Impatiens pallida - etc.

6/23/01 B Beatty

upland veg. included
Am Hop tree, Beech,
Pinus strobus, Green
Ash, Blood root, Asplenium
platyneuron.

Topo line used as
delineation

Drove north on 26th to
Hwy 29, went east to
bridge that crosses river,
took road to west of
golf course past new
houses.
Walked back up to bridge
on 89 & entered woods
to follow topo line. Topo
line matches up with
toe of slope.
Walked approx 300'
along stream edge; near
toe of slope, NWI
matches field conditions
See notes on map

4/24/01 B Beatty

Met at 9:00 Am
Lee Beatty Woods
Went in boat to review
shore between Allegan
Dam & Allegan City Dam,
to see how well boat
will travel in shallow
water, to observe
wetland areas from
river.

Identified location
of channels, locations
of upland areas
adjacent to river,
and stretches of this
river having wetlands.

No GPS points taken today

BB

6/25/01 B Beatty

met at 0800.

Team members:
Beatty, Lee, Wood, Harmon, Borowski

Objective: Wetland delineation along Kalamazoo River
see notes on map

Wood & Beatty in boat, up upstream of Allegan city dam. Drove in from bridge to Allegan City

TALB1 N 42.52227
W 085.85390
elev. 620'

Designated as floodplain & upland veg on NWI map. Field conditions of hydrology & vegetation indicate area is wetland with standing water.

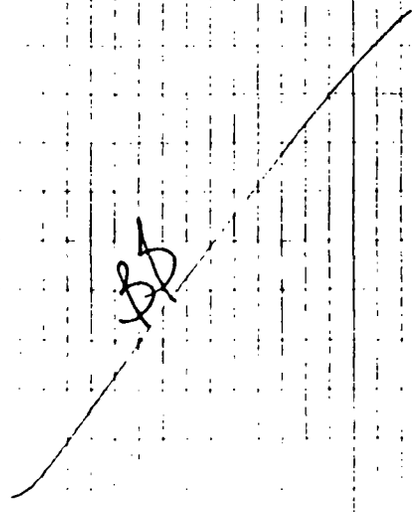
No soil sample taken, could not get to area by boat.

Veg in area:

Black willow Salix nigra,
Fraxinus pennsylvanica,
Red osier dogwood,

edge has upland species such as white pine, red oak, wild rose.

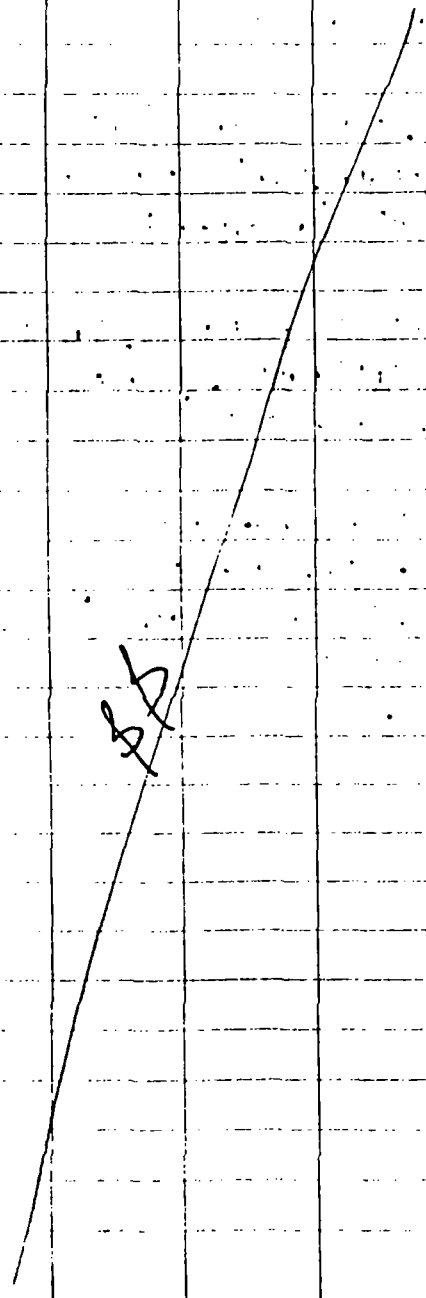
Entire emergent area has veg + hydrology - No sediment/soil checked, all under water.



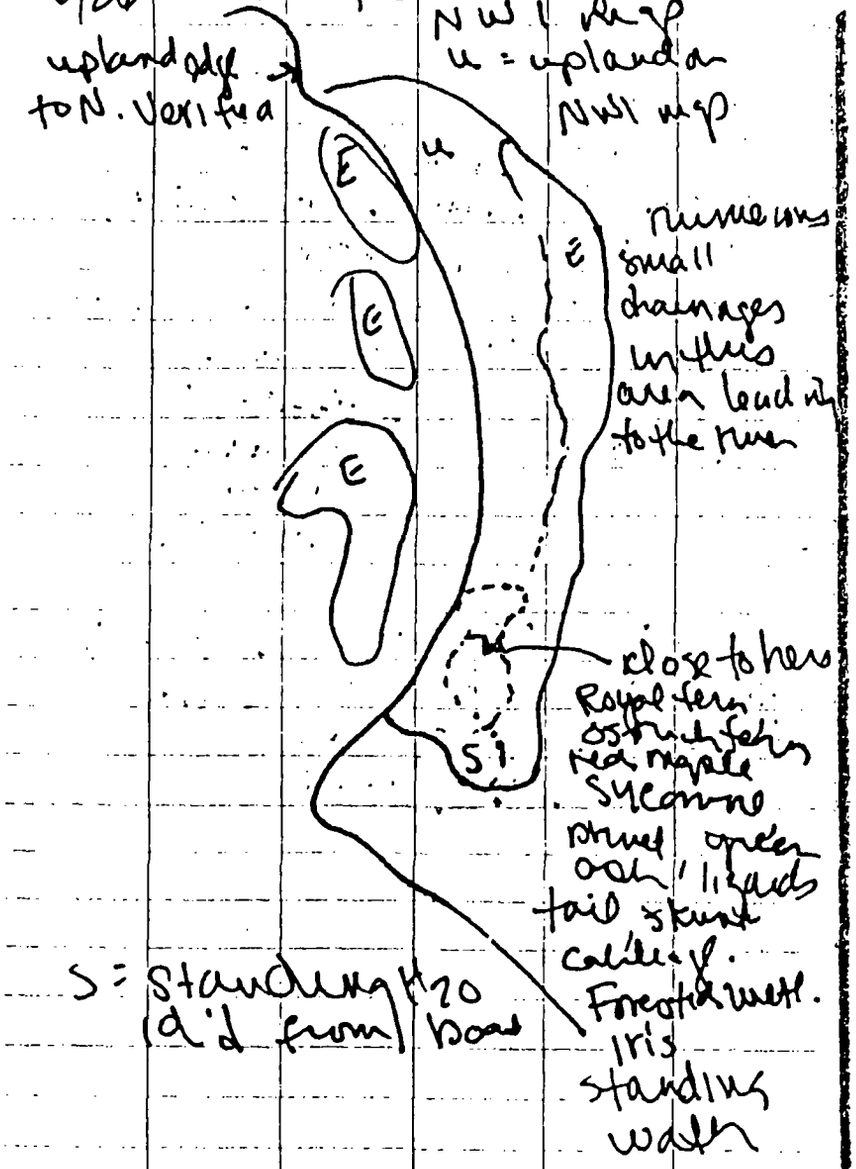
6/26 P. Beatty

Met at 0800
Reviewed maps/ marked
from the run yesterday.
identified locations
to check upland perimeters
by boat + by car.
2 teams — Woods, Lee
Beatty
Harmon
Zawacki

1st stop location 2 marked
on map. Parked behind
Allegan Hospital & entered the woods



6/26 B Beatty E = emergent on NWI map
U = upland on NWI map



Wetlands/uplands Confirmed as mapped on NWI Map

6/26/01 B Beatty

Soils in upland
very fine sandy loam, uniform color, horesidual,
0-9" brown.
>10" - orangish soil

upland area as indicated by NWI wet area kept wet by drainage from above.
plants in up area:
Sassafras albidum, Acer rubrum, Populus grandidentata, Lindera benzoin, Pinus strobus, Vaccinium, Equisetum

Rose breasted grosbeak, red bellied woodpecker, hawk-feather song sparrow, red winged blackbird, deer tracks, raccoon tracks

6/26/01 BB

After lunch area S
upland area w/ wetlands
at toe of slope

Deer tracks, White breasted
nuthatch, tufted titmouse,
Beech, Sugar Maple, Red-
tailed hawk,
Hickory, sassafras, wild ginger,
White pine

Wet at TOS -
Black willow
Standing water
Skunk Cabbage, IRIS

Access to this site through
field to east of 141 Thomas St.

BB

BB

6/26/01 B Beatty

Area 8
- Dexterville
  - Blue jays nesting
  - rose breasted grosbeak
  - goldfinch
- all uplands behind house, vertical slope to water - wetland is at toe of slope.
- confirmed field conditions match NWI MAP

Area 9 -
- No trespassing signs - must access from the river.

bb

6/26/01 B. Beatty

Drove to Trowbridge Dam, work backwards going downstream to see upland extent of 11 & 10

- site 11 confirmed as mapped.

Walked area indicated as "a" on map. NW map indicates scrub/shrub NWI forested.

Veg: Bitternut Hickory, slippery elm, sycamore, green ash, poison ivy, wild geranium, meadow rue, sugar maple seedlings, hackberry, Onzale (numerous): clematis, →

Mapped by NWI as wetland. field indicators do not meet 3 wetland criteria.

Soils uniform to 14" silty 10YR 3/2

GPS point TAL B2

BB

6/26/01 B Beatty

Hydro - No standing water at 14"

There is a terrace here, & some evidence of water movement, but area appears silted in & now supports more upland vegetation

Further towards dam, still betw river ~~& terr~~ ledge. Wild ginger, spicebush, moonseed, violet, draft vines, no 155 on trees, ~~pine seedlings~~, BB Va. creeper

Team should ~~re check~~ from river. site 10?

BB

CONTENTS

PAGE NO.	REFERENCE	DATE
	pit - color; hydrology	

Kalamazoo 6/19/01

Presentation

PCB .007 - 7 mg/g in soil

Georgia Pacific Howard Allied - properties

- purpose - where is wetland community
risk assess. should apply to erosional
parts of river

Jurisdictional wetlands - all ?? yes

Plainwell MI to Allegan

- Dams - purchased in 1985 - PCB
contaminated

10 mil. cu yd - $20 - 2.7 billion

New wetland criterion may be developed
clay PCB material on top of ↔

Numbering system

~~PC~~ PRC ###

P - Plainwell

R - right

#

June 20, 2001

Staff: Jim Lee, Brenda Beatty, Lynn Cudlip, Jennifer Harness, Justin Woods

Objective: Wetland Delineation Kalamazoo R.

Site: Plainwell to Otsego

Data recorded in Brenda's book - Book 3

Phar - FACW+

Acer neg - FACW -

Vitica dioca - FACt

Garlic mustrd - FAC

Arctium - UPL

Honey locust - FAC

Lemnium - ground cover

Crataegus sp.

Pts PRB1 - PRB8 GPSed points in.

Lynn Cudlip 6/20/01 5:00pm

1-9pm. 2 hrs - data forms

June 21, 2001 Lynn Cudlip

Staff: J. Lee, B. Beatty, L. Cudlip, J. Harness J. Woods, A. Santini.

Objective: Wetland Delineation - Plainwell to Otsego Dam

12th Landfill - Plainwell -

Check southern part behind Lember Co. and Sewage Plant - downstream

1st sites - w of Hwy 131 + N. of M89 - inside curve of meander

Dug soil pits (6) inside meander next (west) Hwy 131 - Floodplain area supports Phar, Acer negundo - sandy soils - with H_2O at 30" - do not match soil from SCS map - too well drained - no sign of anerobic conditions in to 12" - no standing water, no saturation conditions within 12" too well drain - In depressions where clay residue exists - Hydric conditions at 23" in sandy soil - nothing apparent - clay layer lower. 5Y3/1 w/ dark staining - NOT WET

- No GPS points taken - not wet wetland line on maps (NWI) is correct.

PLC1 should be OCLC1 - near 131 bridge - W. Otsego
Near manufacturer/auto shop fabricator - below terrace - Cattail/jewelweed complex
Soils: 2.5Y3/1
Hydro: 12" sat @ 6" Emergent
Veg. Eupat
Solidago sp
Cornus stolonifera
Skunk cabb.
Salix nigra
Outside; Upland
Phar Garlic Mustard
Eupatorium Meadow Rue,
Green Ash Silver Maple
gray residue, moist @ 18" - only

PLC2 should OCLC2
Soils: 4-12" 5YR5/6 - sandy - orange
4-12" ↗ mollic layer over sandy
0-4" - 2.5Y3/3 - loam
Meadow Rue, Black Box Elder,
Privet, Virginia creeper Sycamore
Raspberry, Wild Ginger, Wild
geranium, Upland next to Forested

Lynn Cellip 6/21/01 3:30 pm

Lynn Cellip 6/22/01

Met 7:30 am - to organize
partly cloudy - rained previous day
Objective: Wetland Delineation, Kalamazoo R.
Staff: J. Lee, B. Beatty, L. Cellip, J. Woods,
J. Zawacki
Map Location
Fig 8. - Abandoned meander - taken to
in boat to site
Completing transect across - meander
area -
Soil pit at edge of water OCRL 6
0-14 10YR3/1 - sat throughout;
14->16 gray residue 5Y3/1 - mottled
5YR 4/6 ox rhiz., moist only
Phar,
Photo 1, Roll 1
Soil pit: H₂O @ 11"; gray residue 5Y3/1
ox rhiz, mottled Phar, Sambucus, Green
Ash - wet, Elm??

Soil pit in - cattail marsh - sat at site
gray residue; Cattail Phar
Silver maple, Black willow at edge
Purple loosestrife ...

OCRL3 (OCRL3) - corrects GPS line
Forested area Silver maple, Acer
negundo, Phalaris, Anemone
Viney honeysuckle, Lonicera
willow (prock? other
sat at sfc: grey residue down
36" - 543/1 - correction of edge
to show goes toe of slope
Photo 2, Roll 1 - from forested area looking
into emergent marsh

Soil pit - marsh, grey residue 1" water
Grass - rough unid., loosestrife + cattail
at edge
Soil pit - in middle upland - grey residue
moist only at 12"+16" Burdock
mustrd garlic, Acer negundo
green ash

OCRL4 - toe of slope
Phal, Impatiens, Acer negundo
Urtica, green ash; sat at sfc
grey residue - 543/1

OCRL5 - like OCRL6

Finished this side am 11:45
Went to Allegan to get aerial photos
No description for: at NRCS
75B 18 34 30, 66 -
1 Marlette-Capac loams
2 Pits
3 Aquents
4 Aquents + Histosols ponded
5 Psamments,

Got copies of aerial photos

Lynn Cottrup 6/22/01

6/23/01
Staff: J. Lee, B. Beatty, L. Cudly, J. Woods, J. Zawack
Objective: Wetland Delineation
Start Time: 7:30, 8:50 on water
Weather: partly cloudy

Reviewed west of Gun Creek - n. side of River.
OCRC7 - marked as ~~not wet~~ open water unconsol. bottom
NWI maps - this spit of land is wetland - emergent All of it is purple loosestrife - garlic mustard, black willow, cattail
0-10" - 10YR2/1 loam
10 -> 30' - grey residue 5YB/1
mottled. H_2O @ 5"
Roll 1, Photo 3

Soil Pit Photo 4, Roll 1 - Salix exigua example, orange sand w/ organic streaking, mottle layers 2->12
0-2" - mollic organic/mixed layer; sat at site
Phar, Saex, Urtica dioica, Purple loosestrife

Photo 5, Roll 1 - bench at edge of wetland -

Boundary is correct for North side east of Gun Cr.

PM - started on L bank upstream from Trowbridge Dam & walked upstream along bank, returned to boat and boated up to area delineated 6/22/01
soil test pit - at head of bend
Rubeckia, Phar, Urtica, ground cover
Acer negundo; grey residue - 2' above river, but gets inundated
Wet - NWI - correct.

soil test pit - moist @ 12" grey residue past peak flow higher previously Phar, Urtica Saex, Acer negundo, Cattail / Jewelweed

turtle - deer track seen

Phar = Phalaris arundinacea
Saex = Salix exigua

3:00 pm back at Trowbridge Dam

Lynn Cudly
6/23/01

CONTENTS

PAGE NO.	REFERENCE	DATE
	WETLAND	6/20/01
	Delineation along	
	Kalamazoo River	
	to	7-11-01

JUNE 20, 2001 9:00
STAFF: JIM LEE
Brenda Beedy, JENNIFER HARNESS,
LYNN CUDLIP
JUSTIN WOODS
OBJECTIVE: Wetland delineation
Kalamazoo River
north bank @ Plainwell
Dam going to Otsego dam.

PRE 01
Hawthorne
Ulmus
H. locust
Phytolacca
Urtica
Viola
~~Lamium purpureum~~ Glechoma
hederacea
Iris
Burdoc
Vir creeper
Rosa multiflora
Ash, Green
Leonurus cardica
Motherwort
Alliaria officinalis garlic mustard
Galium aparine

5y 3/1
Oxidoxol riz
mottles

6-20-01

PRL-1 UPLAND soil

0-6" brown sandy loam
6-12" orgnge brown - "
>12 " " moist
gravel

red oak : Quercus rubra = UPL
phytolacca americana = FAC

PRL2 -

0-12" soil gray residual 5Y 2.5/1

@ 12" moist

vegetation:

Acer negudo	T	FACW
Gled tria	T	FAC
Crat crus	T	FAC
Ulm. rabra	T	FAC
Phytolacca americana	H	FAC-
Urtica dioica	H	FAC+
garlic mustaud	H	FAC
Solidago	H	
Burdock:	H	UPL
Virgin creeper	V	FAC-

James B Lee 6/20/01

6/20/01

PRL-3 1:51 PM

Soil Grey residual earth
0-6" " " w/ worm
6-12 - same -

Acer negundo FACW-
Burdock : Arctium lappa = UPL
sting nettle : Urtica dioica = FAC+
violets - Viola
?
grapevine : Vitis UPL

Rubus -

UPL :

Sam. bucus canadensis FACW-
Grapevine : Vitis

PRL 4 wet

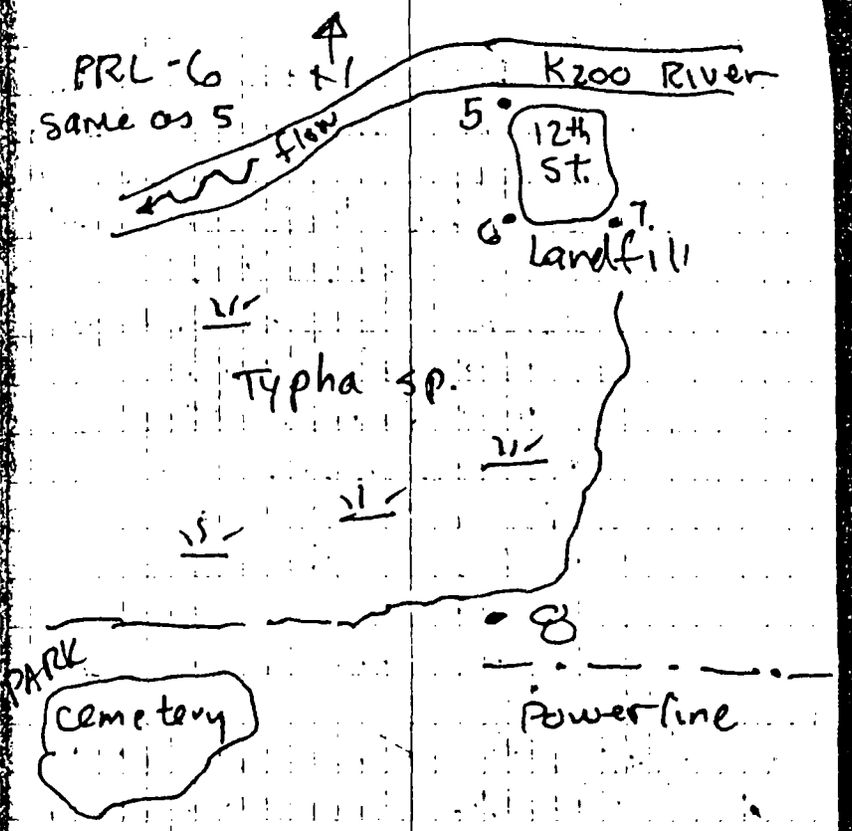
Veg: Phalaris arundinacia FACW+
Urtica dioica FAC+
Crataegus crus-galli FAC

0-12" 5Y 3/1 Gray residual
>12" fine Sand Oxy res.

UPL: same species
hydrology : none
soil: some no oxy Mg zones

James B Lee 6/20/01 5:PM

JUNE 21, 2001 8AM
STAFF: SAM= AS DAY BEFORE
OBJECTIVE: wetland Delineation along Kalamazoo River near 12th Landfill;
BEGIN W/ PRL 5 at 12th St
Landfill # W Corner.
Toe of Slope of Landfill
Phal
Acer
Ash
Mustard
Typha
ground water 10"
Soil
0-8" Gray med to course sand w/ gravel & roots (Moist to surface)
8-12" Gravel w/ sand medium
FRL-6
corner of Landfill @ TOB
same vegetation
soils - Hydrology; saturated to surface
RAINING



PRL-7

At edge of Landfill and industrial mining operation vegetation: typha anagust Impatiens pallida and Acer negundon.
Uplands vegetation begins at toe of slope.
Acer rubrum. Acer saccarinum.
Soils are residual gray material. Hydrology is saturated soils to surface GPS was used to Id location

PRL-8

This site has a defined break in elevation from herbaceous emergents to deciduous upland Forest system.
Typa, Salix & Acer negundon w/ skunk cabbage & reed grass
upland begins at slope.
Hydrology: saturated to soil
Soils are poly chromatic at line w/ no residuals.

End 1600

James B Lee 6/21/01

6/22/01

Kalamazoo River Wetland Delineation. Team #1 began east of Ostego City dam - south bank (right).
Weather = 60° F, partly cloudy, slight breeze from west
Same staff except Drew is is present, replaced with Jay Zawcki.
Station PRL 9:
wetland vege: Acer negundo, canopy reed grass with Typha dominated west end. Impatients at transition with deciduous trees.
Tree line along bank is the wetland boundary..
Soils: Gray residual up to tree line with soils saturated to surface.
hydrology - saturated soils disappear at tree line. Elev. grade rises at treeline soils change; no residue.

PRL 9 upland

Vegetation: · catalpa
Acer negundo,
Ash. Acer rubrum
Grapevine (Vitis sp),
Impatients & Rubus
(glaucc) along transition
Viola sp. & Trilium sp
at slope.
Rosa multiflora
Burdock, apple.

Soils: Dark brown-black
0-10 fine sand with little
clay, roots present.
10-14" fine to medium brown
sand with gravel.
no water in pit, no
organics present.
Hydrology: no water in pit

PRL-9T (Tributary
confluence identified
using GPS- 5' to 6' banks
on each side - sand bottom
Lots of deer tracks.
width 60' water depth 2"
3' wide water flow.
11:00AM

PRL 10 - Photos 1 & 2
Taken looking north from
bank of upland area.
Vege in wet-
Burden
loosestrife
impatients
Salix
Aspen
upl Prunus
Carya
beech
Acer -
vit creeper
POISON IVY
Ash
Pinus
Hydrology - Saturated to surf.
Area has two pine islands
NOON - Lunch - visited NCRS
to obtain aerial maps
and soil characteristics
for hydric soils within study
area. Soils dark brown - saturated
to surface

James B Lee 01/22/01

06/23/01 800 AM

STAFF: JIM LEE, BRENDA BEATTY, LYNN CUPLIN, JAY ZICOWSKI & JUSTIN WOODS

OBJECTIVES Wetland Delineation along Kalamazoo River & confirm wetland NWI map.

Collected Lunch foods and trailered boat to Trowbridge dam, Launched boat on east side. Team 1 walked north side of bank, Teams 2 & 3 conducted survey on south side of bank upstream of Trowbridge dam.

Wetlands included herbaceous species (PEM) along the bank. As the slope increased along the shore line, Forest of trees dominated the slopes, The toe of scope is the wetland line

The hydrology consisted saturated soils to surface, drainage patterns thru the wetlands, stained leaves, and drift lines.

Soils consisted of Gray residual soils. Areas below 12 inches contained poly chromatic colored soil.

One area adjacent to the highway M 84 contained FACULTATIVE Vegetation, soils not meeting hydric conditions and little or no hydrological indicators.

Teams 1 & 3 also investigated the shoreline from Trowbridge dam east to Otsego City dam bridge; along River Road. These areas confirmed the NWI mapp.

No changes were made. ——— to do paperwork.

end at 3 PM

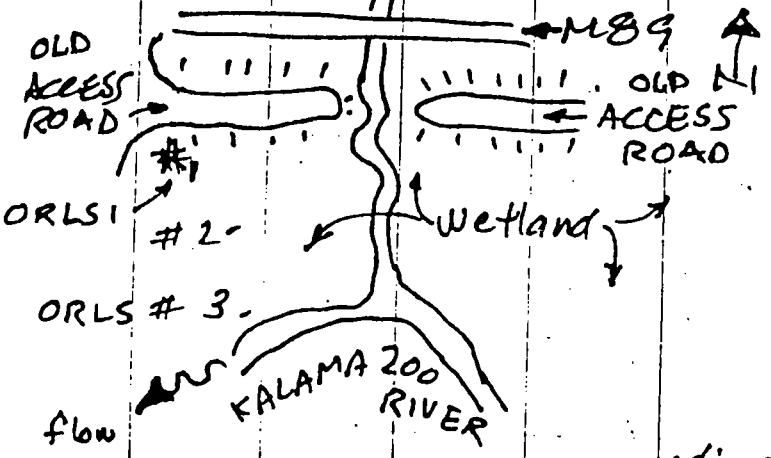
James B Lee 6/23/01

6/24/01 Kalamazoo Riv
STAFF: JIM LEE, BRENDA BEATTY & JUSTIN WOODS
OBJECTIVE: Delineate wetlands along the Kalamazoo River.
Weather 63° to 80° F partly cloudy.
Wildlife - ducks, wading birds & fish observed.
Looked for access to river from Allegan City Dam. none found. Reviewed shoreline from Allegan City Dam upstream with in city limits. Areas include wetlands along M 89, No GPS stations were identified. Wetland systems adjacent to M89 is south of M89 Bridge. The wetland is both emergent and forested. This area fits with the NWI Map. completed about 4 PM Team I only. 6/24/01
James B Lee

6/25/01 Kalamazoo River
staff: Jim Lee, Brenda Beatty, Justin Woods, Jay Zawacki, & Jennifer Harness
Objective: Wetland delineation along Kalamazoo River from Allegan City Dam upstream to Trow bridge Dam.
Team I JBL, JH, & JZ walked in and along tributary adjacent to M89. The site contains an old bridge crossing where the tributary flows south and converges into the Kalamazoo River. The wetlands on each bank are predominantly forested with small emergent wetlands. The emergent wetlands include cattail and willow. The remaining forested area include silver & red maples, aspen, Box elder, and paw paw. Groundcover includes stinging nettle, rose, and canary reed grass.
James B Lee

6/25/01 continue

Three GPS stations were marked the wetland boundary. The first GPS station (ORLS 1) is on the south side of the old berm and access road that ends at the tributary



Wetland Vegetation:

		indicator
Tree -	Acer negundo	FACW
herb. -	Phalaris arundinacea	FACW+
Tree	Platanus occidentalis	FACW
herb.	Thalictrum dasycarpum	FACW

soil: residual 0-12" Gray silty clay material - no natural soil - no water table within 12 inches

continue with 6/25/01 meets criteria. Hydrology weak however. At NWI mapped area.

STATION OSRL 2

Interface with Forested upland hardwoods and shrub-scrub and palustrine emergent wetland.

Vegetation:

herb	Typha angustifolia	OBL
SS	Salix sp	OBL
herb	Urtica dioica	FAC+
herb	Phalaris arundinacea	FACW+

soil: 0-10" Gray residual
10-12" Brown w/ sandy clay
poly chromatic

weak hydrology no water

upland vegetation

Tree:	Populus	FAC
	Robinia Pseudoacacia	FACU-
	Betula sp.	FAC

STATION OSRL 3 near K200 River bank at top of turn. Hydrology weak, soils: 0-10" dark brown 10-15" Light brown sand

6/25/01 Continued

vegetation: SLR3

herb	Rosa multiflora	FACU
Tree	Acer rubrum	FAC
Tree	A. saccharinum	FACW
Tree	Populus deltoides	FAC+
herb.	Rubus sp.	FAC
herb.	Phalaris arundinacea	FACW+
Shrub	Viburnum Lentago	FAC+
shrub	Cornus stolonifera	FACW
herb	Solidago Caesia	
shrub	Crataegus crus galli	
Tree	Acer negundo	FACW
herb	Carex Sp Gantea	OBL

OSRL4

Tree	Salix sp.	
herb.	Phalaris arundinacea	FACW+
tree	Acer negundo	FACW-
herb	Urtica dioica	FAC+

Soils: 0-15" gray residue
not moist
not dry
⇒ upland

6/25/01
James B Lee

6/26/01 Kalamazoo River
Wetland Delineation
Objective: Delineate wetland and confirm NWI map along the river between Allegan City Dam & Trowbridge dam by boat.
Team 1 Justin Woods Allegan City Dam
and Jim Lee
Team 2 Brenda Beatty, Jay Zawacki and Jennifer Harness - walked from Trow bridge Dam south bank.
Weather: 68-85° F partly cloudy sky - slight breeze.
Team 1 visited 4 sites and GPS 3, Areas 1, 3, 4, we boated to Williams Road bridge - Looked for access points. Too steep for boat launching. Ttl along curve of river wetland at edge 10-30 feet. then pines, Hydrological indicator (lichen lines on trees)

6/26/01 TLL1

Soil are hydric at back but are not present 30' landward. Pines begin to dominate at that point.

IRC 2 include vegetation:

Catalpa
Beech
FACU Sassafras albidum
horsetail
poison ivy
stinging nettle
Hickory
Virginia Creeper
Locust and
Panicum grass.

Area is Upland.

IRC 3 - along ~~ox-bow~~ corn
steep slope -
Acer Sp. at edge
upland trees - on edge
of slope to top of
bank.
canary reed grass
poison Ivy present.
Soils hydric at bankcup
to about 3' above water line.

TLL 4 6/26/01

Oxbow

vege: Acer sacc
lizard tail
burdock
canary reed grass
Cornus
Ash
Sagittaria

upland species at bank include:
paw paw
geranium
Hickory and
Panicum.

Hydrological indicators
for OVT about 3' from
water elev. same as
soils - no residue
at this point.
NWI maps are
confirmed at these
points.
Ended @ 5 P.M.
meet Team 2 at Majors
6/26/01
James B Lee

6/27/01 J. Lee 8A
Fillin field sheet
and back. Review
maps, id plants
Submit Daily Report

End 7:30 PM
James B Lee

12 noon
7/5/01 Kalamazoo River
Wetland Delineation
staff: Jim Lee and
Justin Woods.
Objective: Preparation
wetland survey.
Visited the Natural
Resource Conservation Service
in Allegan City to obtain
soil survey information.
Obtained other materials,
supplies, and equipment
to conduct wetland
survey.
Review data in preparation
for field survey tomorrow.
ended 5:30 PM

James B Lee 7/3/01

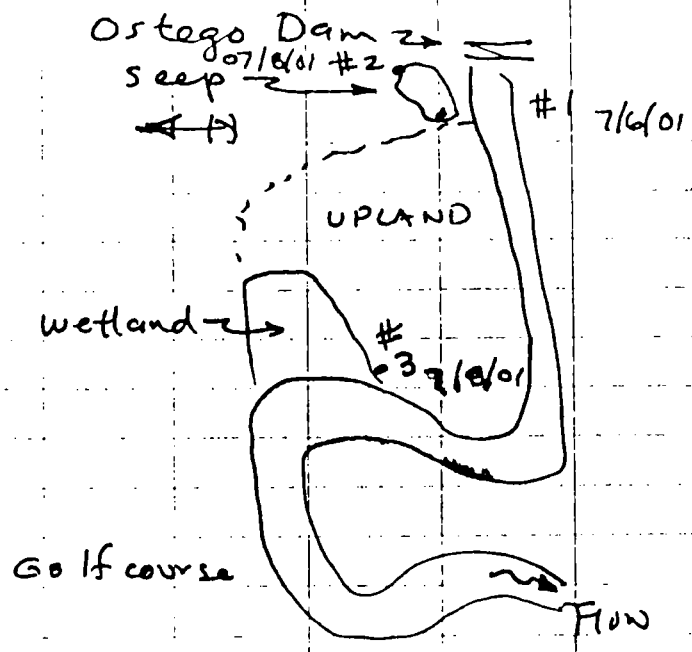
7-6-01 Kalamazoo River Delineation 8:00 AM
Submitted yesterdays daily report.
Staff: Jim Lee and Justin Woods
Objective: conduct wetland survey and confirm NWI map.
Visited three locations and GPS one point (ORL 1). Study area was between Trowbridge Dam and Otsego City Dam. (North side of the river).
Team 1 checked the river along 26th St, 109th Avenue and the Lynx golf course area. We were looking for the garden adjacent the river where residual appears to be present. Did not locate the garden today.
Weather: 60 to 75°F. breeze and partly cloudy.
Ended survey @ 5PM
James B Lee

7-7-01 Kalamazoo River Wetland Delineation;
Staff: Jim Lee and Justin Woods
objective: Continue wetland delineation and NWI map verification.
Visited the Lynx golf course to complete the wetland area survey. No GPS points were made because NWI map indication data map to be true (accurate).
Stopped for Lunch @ noon
Traveled along M89 and 109th St to find access to the river.
We stopped at Bridge Road and noted the banks on both sides were very steep with occasional narrow bands of emergent vegetation (Canary reed Grass - dominate) at the bank.
The steep slopes consisted of hardwoods with groundcover vegetation. The wetland is well defined along this stretch of the river. Took photos (4) of the vegetation.
James B Lee 7/7/01

Kalamazoo River
Wetland Delineation - 7/7/01
continued from previous page
We travel to Plainwell to the Dam and took representative photos of emergent vegetation as well as the dam structure. Turned in film to be processed. Completed site visits at 4:30 pm. Continued to complete paper work until 7 pm.

James B Lee 7/7/01

7/8/01 Kalamazoo River
Wetland Delineation
Staff: Jim Lee and Justin Woods
Objective: Confirmed NWI map along the Kalamazoo River, Between Plainwell and Allegan City Dam.
Weather: 60's in the morning warming to 80's in the afternoon. Partly Cloudy skies.
Traveled along the south side of the River along River Road. Areas were verified to be representative with the NWI map.
The area on the north side of the river, between the Ostego Dam and the golf course (Lynx), were surveyed. One area was noted as incorrect. Two GPS points were made (ORL 2 and 3). The area was a forested and considered upland but was recorded by NWI as a wetland.



#2 Wetland

Acer negundo
Canary reed gram
ferns
Burdock
Elm

Organic soil
hydrology

Upland

Sassafras
Yarrow
Rubus
Solidago
Pinus
Big Tooth Aspen
A. trifida
sandy soils
no hydrology

Kalamazoo RIVER 7/8/01

#3 UPLAND

Elm
paw paw
1 Hawthorne
2 Hawthorne
Poison Ivy
Mayapple
Burdock

> 18" fine sand
no hydrological indicators

0-6" Brown
6-12 Brown
> 12 Light brown

Wetland

Impatients pallida
Stinging nettle
Acer negundo

Organic soil
Saturated to surf
Dark Brown
fine sand

0-18" Brown
> 18" Light Brown mottled fine sand

Attempted to pick up flm but was not ready.
End survey for the day @ 4:30 pm

James B Lee 7/8/01

7-10-01

Kalamazoo River

Staff: Justin Woods, Murray Wade, and Jim Lee (OCRI) GPS station

Objective: Determine wetland line and compare with NWI map. Photo taken of Garden (#7)

Location: Garden on north side of Kalamazoo River downstream of boat launch. 4x4' white sign on bank helps identify location.

Within garden: vegetation includes:

Canary grass reed
moon wort
pig weed
Burdock
Carex sp.
fleabane
Portulaca w/ yellow flower
"

Solidago sp. cas.
Trifida

Soils: 7-10-01

Grey residual down to 30" plus.
Water table from surface 20"

Surrounding area
A. ~~negundo~~ rubra
Celtis occidentalis
Mulberry
Cotton wood
Salix

Wildlife: in herb area
Cedar waxwing
Tree swallow
Common yello
Eastern bluebird
Red wing blk   Am Goldfinch
House finch   Am Crow
Cow bird
blue jay
indigo bunting
Red belly wood pecker
Song sparrow
Am robin
in woods turkey & deer

7-10-01

Hydrology
no flow way
water table > 20"
no saturation or inundation
of soil.

2ND SAMPLE SITE: (OCR2)
Toward River (20' from River)
Dug Down 32 inches
No Water
Apparent levy

Soil: 0-12" Brown sand
12-32" residual-gray
no water -
at 32" residual was
damp but not moist

Hydrology:
no indicators were
present.

vegetation:
Acer negundo FACW
Phalaris arundinacea FACW+
Sambucus canadensis FACW-

Area not a wetland. no hydrology
Meet NWI Map.

7-10-01

Note: This area was surveyed by Lynn Cudlip on June 21, 2001. The day after we had heavy rains all day.

Areas where site surveyed indicated as wetland. The site shows drainage ways through the levy to the river.

The NWI map indicates a fairly close agreement with hydrological indicators.

All parameters were reviewed and the site has some indication of wetland and other areas are definitely wetland.

The garden is considered upland (> 20' water table below surface)

Returned to boat and discussed wetland conditions.

Closed out by reviewing NWI maps, Lynn Cudlip's data, soil map and aerial map. Prepare report.

5:30 pm. 7/10/01 60°-78°F

James B. [illegible]

7-11-01 Kalamazoo River
Wetland Delineation and
NWI map confirmation.
Present: Justin Woods,
Murray Wade, and
Jim Led. 63°-78° F
Breezy, partly cloudy
Location: M89
Between golf course and
109th St @ Schnapel Creek
Confluence, west bank.
Visited the river bank
and walked landward
testing the soils, noting
vegetation (changes if any)
and hydrology,
The residual was present
throughout the remnant
floodplain to approximately
200 ft from the toe of
steep slope.
The vegetation was
Acer negundo, Salix sp.
Urtica dioica, and
Phalaris arundinaria.
Menispermum canadense and
Populus deltoides were present.

7-, 01
Soils taken indicated
residual for over 12"
depth of pit. The
second sample:
0-5" Residual
5-18" 10YR 4/6
The pit was dry, no
moisture or dampness
present.
No hydrological indicators
present.
GPS ORL-7
approximately 55' from
bank of the Kalamazoo
River.
Wildlife observed:
Deer tracks, turkey, 13 line ground
squirrel, indigo buntings, Hermit
thrush, white breasted nut hatch,
cardinal, Hawk, Red wing
black bird, common yellow
throat, Chickadees (blk capped)
Catbird, Great blue heron
End survey
James B Lee 7/11/01

7/9/01 Kalamazoo River Wetland Delineation

Staff: Justin Woods, Murray Wade and Jim Lee.

Objective: Confirm NWI map with site's condition at OU 1 (Allied Paper Inc.) site. (Portage Creek).

Weather: 60 to 86°F Partly cloudy with breeze.

Begin with obtaining equipment at the storage building and picking up the film that was processed.

Returned to pick up Murray Wade. Began survey @ NW corner by entrance gate. (Station POR-1), outfall and gravel. Approximately 60' from outfall structure where rock (gravel) ends and natural vegetation begins.

Water line along creek is well defined. Seasonal High water 1' from existing creek level.

Soils:

UPLAND

0-12" 10YR 4/3

NO WATER

NOT SATURATED TO SURF

& NO ODOR.

WETLAND

fine sand

0-2" 10 YR 3/1

2-10" 10 YR 4/3

SATURATED TO SURF.

VEGETATION:

WET.	UPL.
	Syc.
Loosestrife	canary grass
canary reed.	Fox tail
juncus effusus	Poplar - Tree
	Acer rubrum - Tree
	fleabane

Wildlife: raccoon

pigeon

deer track

Indigo bunting

POR 2
East of Building
ADJ. Cattail Stand
EDGE OF Cattail Stand
inundated 10% of time
Cracked soil - indicating inundation
Soil 0-12" 10 YR 4/3
No water to surface
Photo 1 - looking north, Photo 2
Vegetation

Wet	Upland
FAC+ Poplar deltoides	White Flowers
OBL Juncus effusis	Yellow Flowers
grass	
Cattail	

Paramic

Killdeer, RW Blackbird, AMCR

Walking South

Wetland line is toe of Slope + up from toe

Most area seepage

Murray Wole 7/9/01

Outfall Just past Constriction

Mourning Dove
Song Sparrow

POR 3
Near Stand of Cottonwoods
and at toe of Slope

Soil 0-12 10 YR 4/3 at wetland line
Moist to Surface

Vegetation

Upland	Wet
Vir. Creeper Cottonwood	Cattail
P.I. Sumac	foxtail
Grape BoxElder	Soft Rush
Thistle	Carex Sp.
Sycamore	Rosa Sp.
Sp. Needle (Bidens alba)	Rumex Sp.

Birds - SOSP, HOFi, RWBL
Killdeer, Chimney Swift.
Murray Wole 7/09/01

Pc 23 ?

l Fill .

#84

Sheet Pile

under Sheet Pile
East Side
S Pile #84

t, water, revetment
th, along
ent

eer Sign

Smartweed
salix
Foxtail
Rumex
(Curly doc)
Carex (large head)

7/9/01

Por 4

Wetland ½ up Slope
at Culvert under Cork St.

Soils - Manmade - Channelised Ditch - Urban

Slope Veg.

~~Nannyberry~~

Elm

Acer Negundo

Grape Vine

Green ASH (white?)

grasses

Photo 5 - Slope

Photo 6 - Culvert

Birds - In. Bunting, MODO

James B. Lee

7/9/01

Allied Card Fill ..

Sheet Pile #84 ...

Wetlands from Sheet Pile to Creek

water going under Sheetpile East Side

Photo 3 + 4 - Spile #84

Photo 3 - Pit, water, revetment

Photo 4 - South, along revetment

RTHA, NOCA, Deer Sign
Blue Jay

Veg.

Soft Rush
Cattail
Impatients Palita
oxalys
Ragweed
Thistle

Snowfruit salix
Foxtail
Rumex (curly doc)
Carex (lanceted)

Mary Linde 7/9/01

Por 4

wetland ½ up Slope at Culvert under Cork St.

Soils - Normode - Channelized Ditch - Urban

Slope Veg.

~~Nanny berry~~
Elm
Acer Negundo
Grape Vine
Green Ash (white?)
grasses

Photo 5 - Slope

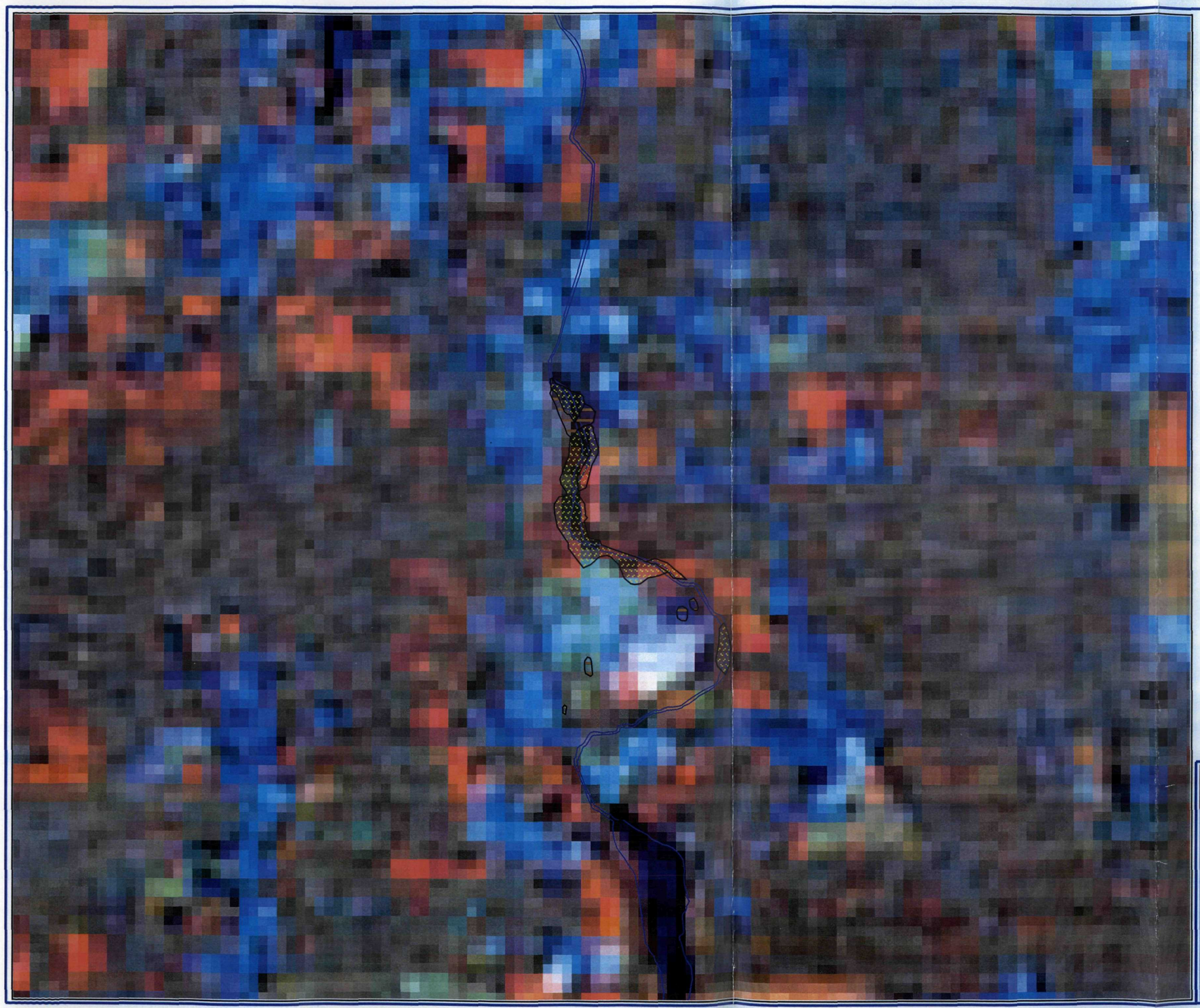
Photo 6 - Culvert

Birds - In. Bunting, Robin

James B Lee

Mary Linde 7/9/01

Appendix C



Infrared Image Versus Wetland Delineation

Reach PC

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

CDM

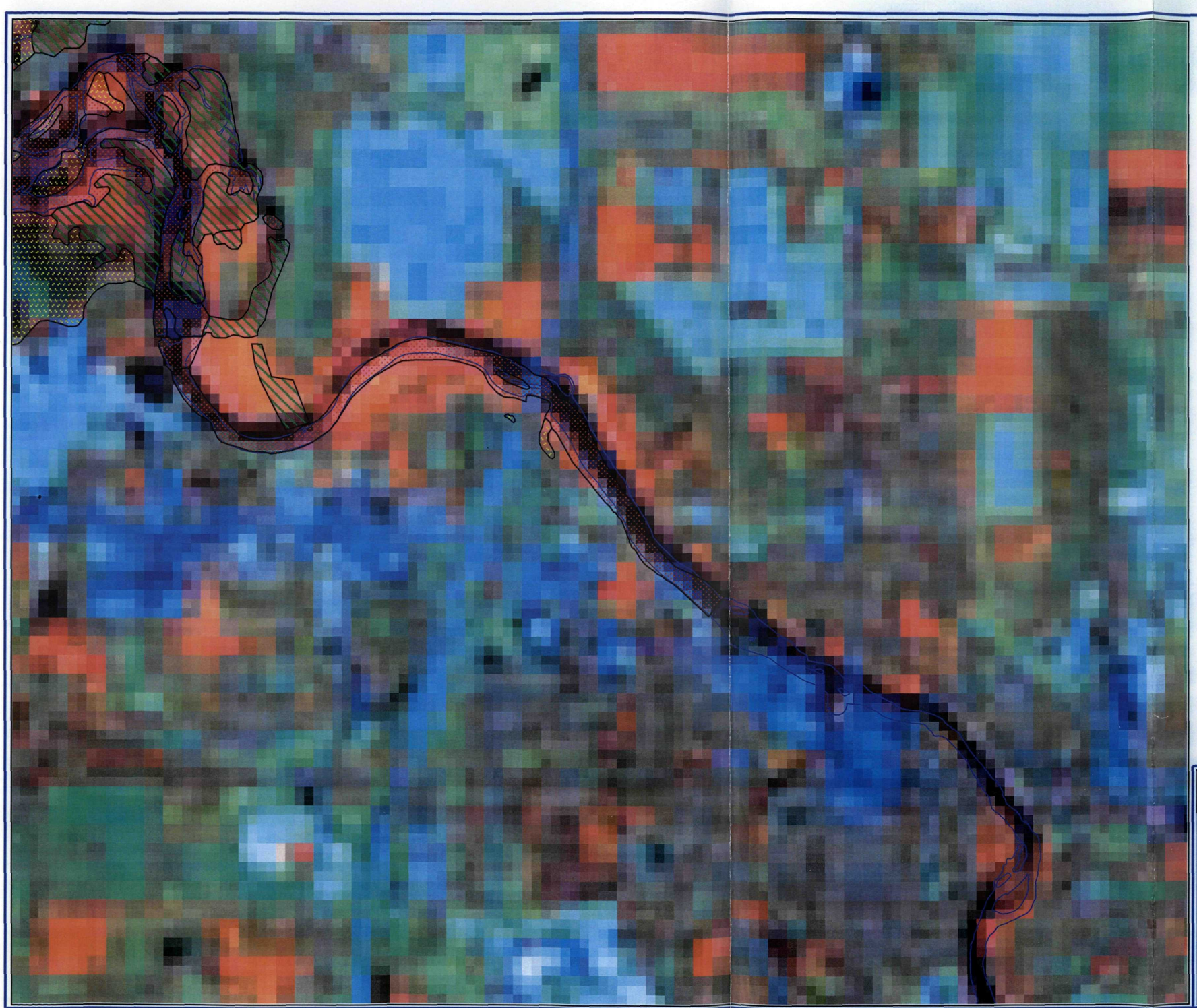
One Woodward Ave., Suite 1500
Detroit, Michigan 48226
Phone: (313) 963-1313
Fax: (313) 963-3130

Prepared By:
- J. Harness
Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach PC
Portage Creek

Figure C.1



Infrared Image Versus Wetland Delineation

Reach B

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

River

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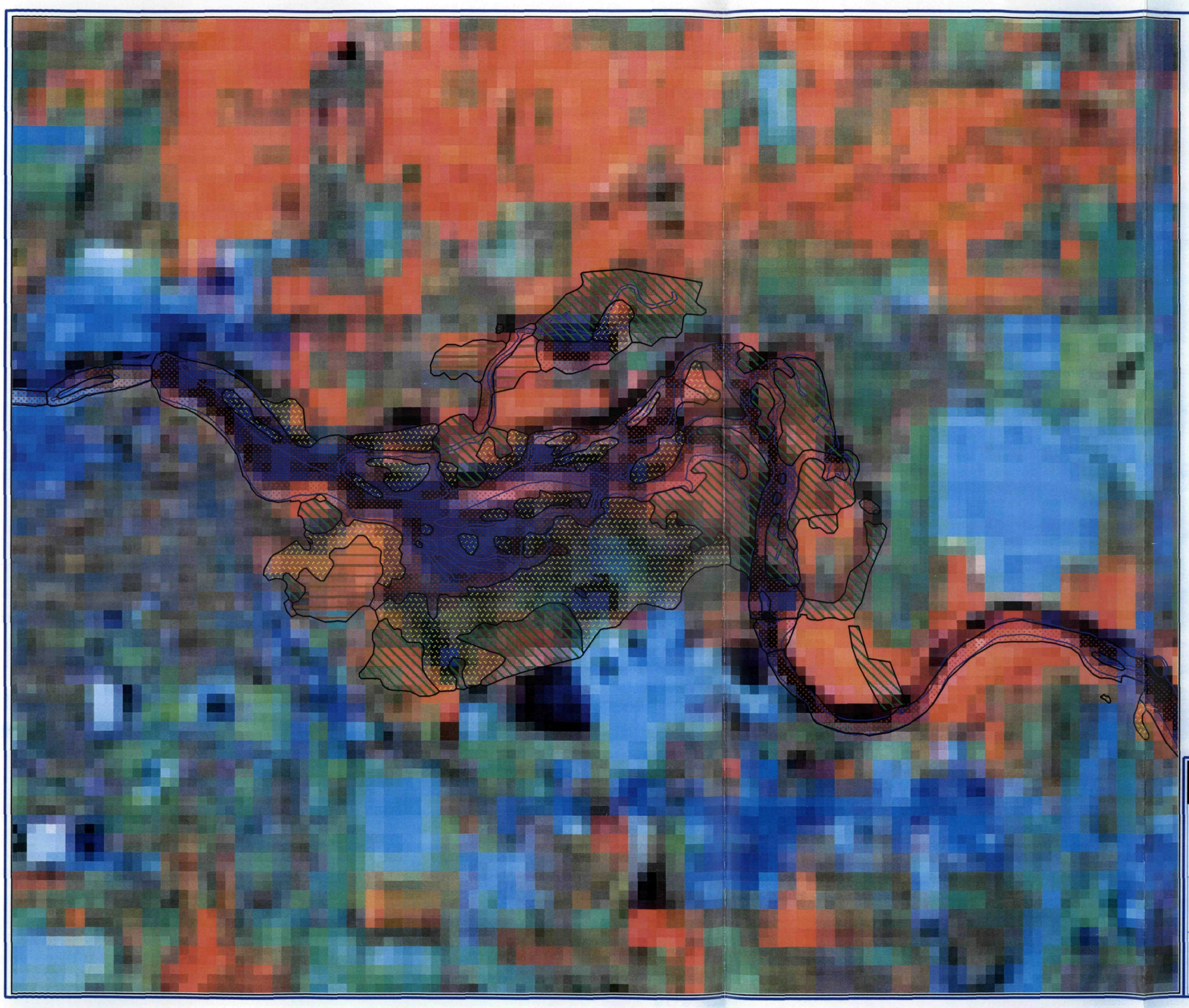
Reach B
City of Plainwell to Plainwell Dam Impoundment

Figure C.2

Infrared Image Versus Wetland Delineation

Reach C



Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
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Light Purple-Teal: Shrub/Emergent Wetland
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River

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(2) Landstat TM Imagery taken spring 1991.

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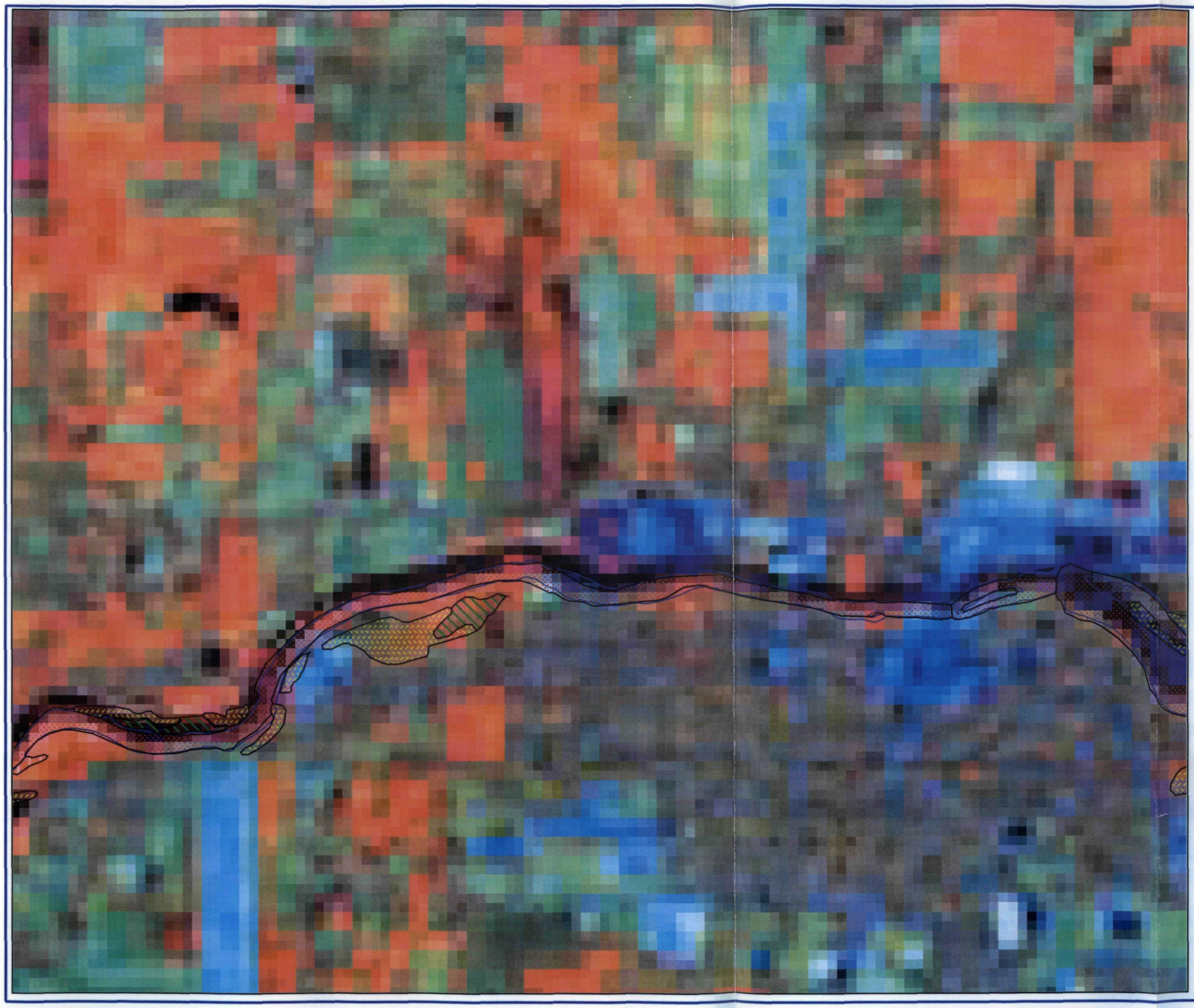
Reach C
Plainwell Dam Impoundment to Otsego City Dam Impoundment

Figure C.3



Infrared Image Versus Wetland Delineation

Reach D

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

- River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

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Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach D
Otsego City Dam Impoundment to Otsego Dam Impoundment

Figure C.4

Infrared Image Versus Wetland Delineation

Reach D

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

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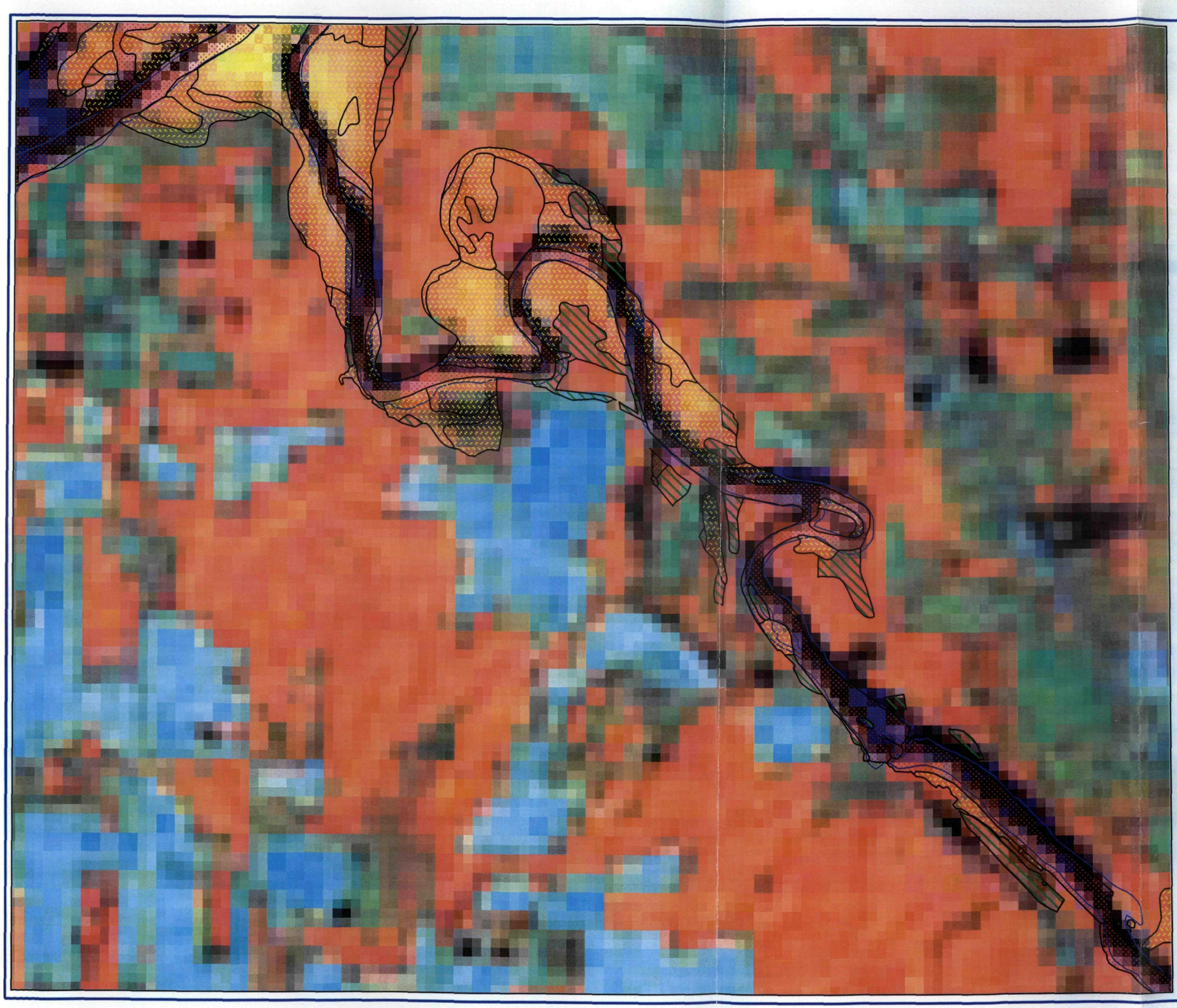
Reach D
Otsego City Dam Impoundment to Otsego Dam Impoundment

Figure C.5



Infrared Image Versus Wetland Delineation

Reach E

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

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Prepared By:
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Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach E
Otsego Dam Impoundment to Trowbridge Dam Impoundment

Figure C.6

Infrared Image Versus Wetland Delineation

Reach E

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

CDM

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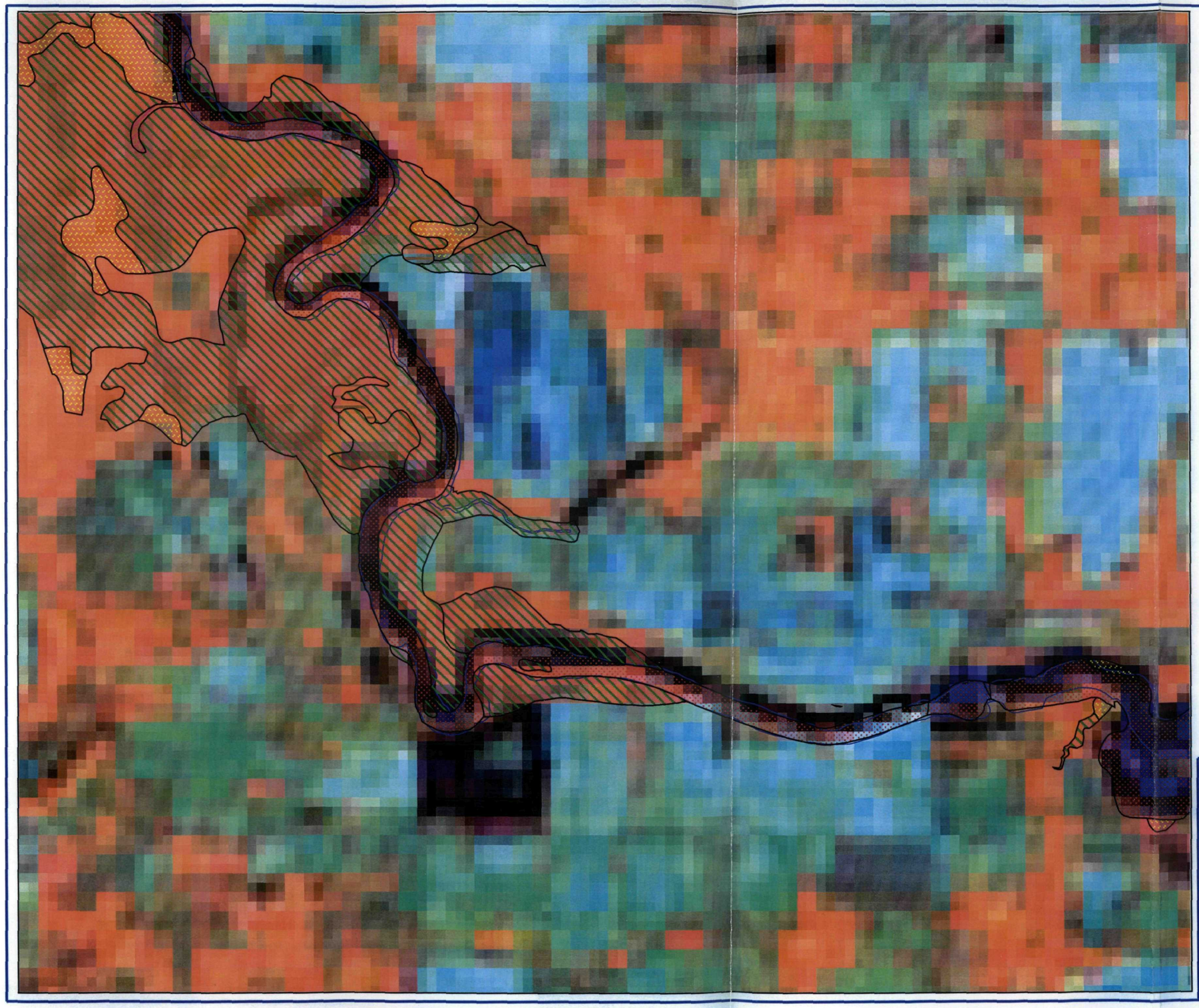
Prepared By:
- J. Harness
Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach E
Otsego Dam Impoundment to Trowbridge Dam Impoundment

Figure C.7



Infrared Image Versus Wetland Delineation

Reach F

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

- River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

CDM

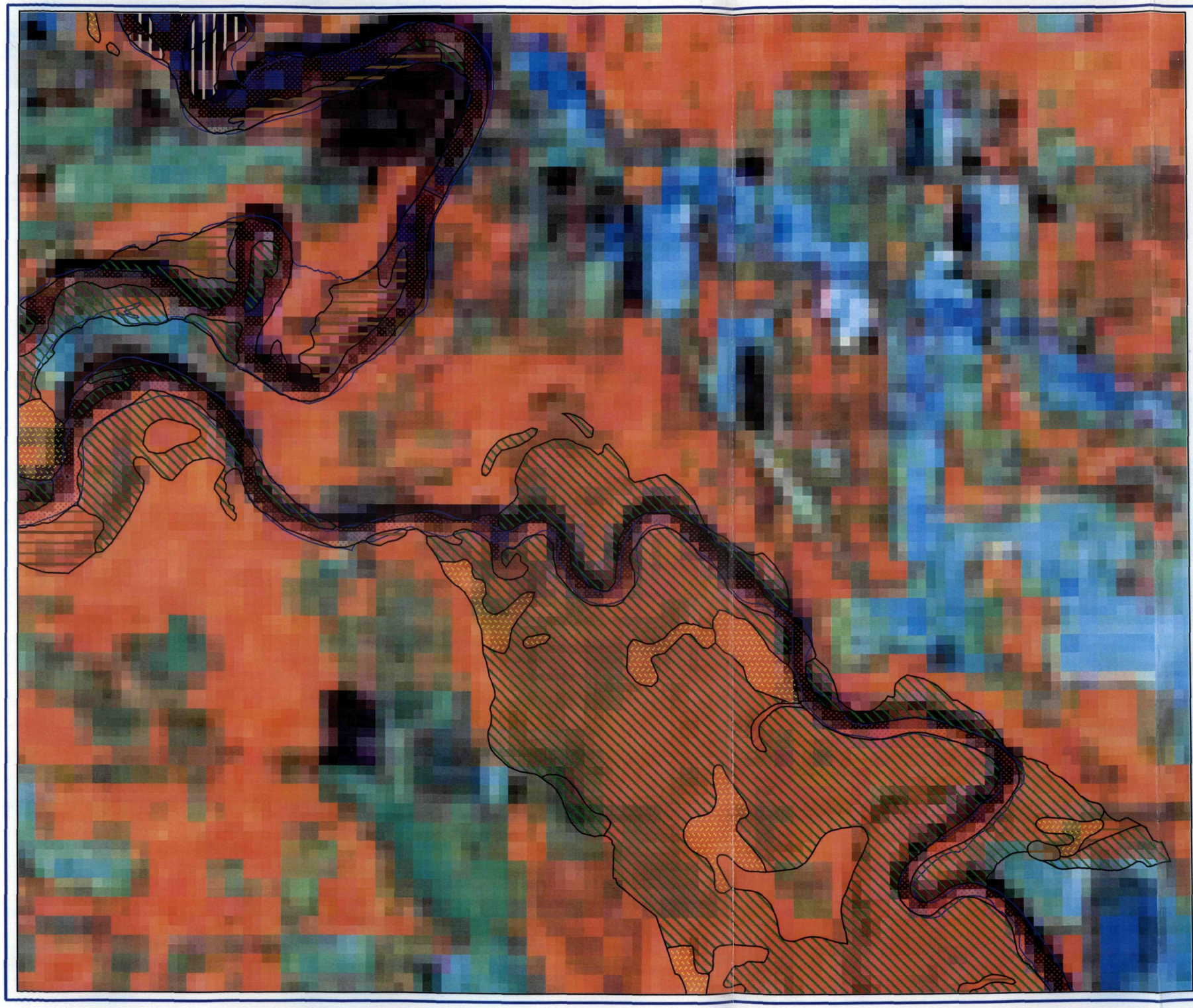
One Woodward Ave., Suite 1500
Detroit, Michigan 48226
Phone: (313) 963-1313
Fax: (313) 963-3130

Prepared By:
- J. Harness
Date:
- December 18, 2001

Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure C.8



Infrared Image Versus Wetland Delineation

Reach F

Legend

Wetlands

- Aquatic Bed
- Emergent
- Forested
- Open Water/Unknown Bottom
- Scrub-Shrub
- Unconsolidated Bottom
- Unconsolidated Shore

Landstat TM Imagery

Blue-Gray: Urban areas
Cyan: Grass/Agricultural Land
Bright Orange: Deciduous
Darker Orange: Northern Hardwood
Dark Purple/Mixed Orange-Purple: Evergreen
Light Purple-Teal: Shrub/Emergent Wetland
Light Blue-Dark Blue-Black: Deep to Shallow Water

- River

Notes:
(1) Wetland data derived from ground truthing of NWI maps.
(2) Landstat TM Imagery taken spring 1991.

N

0 1000 2000 Feet

1:12,000*

On 11" x 17" landscape print-out

CDM

One Woodward Ave., Suite 1500
Detroit, Michigan 48226
Phone: (313) 963-1313
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Prepared By:
- J. Harness
Date:
- December 18, 2001

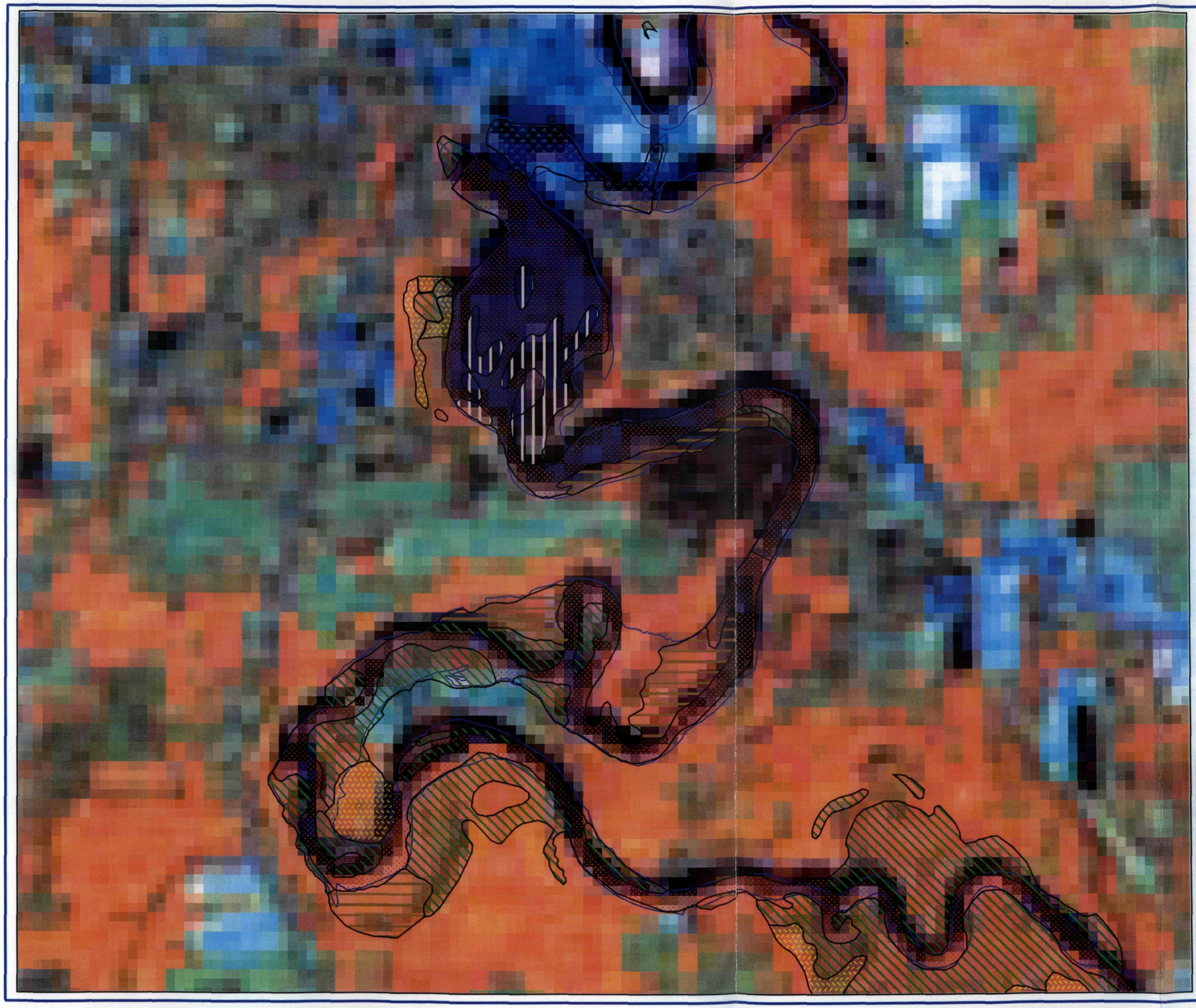
Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure C.9

Infrared Image Versus Wetland Delineation

Reach F



Legend

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- Aquatic Bed
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Reach F
Trowbridge Dam Impoundment to Allegan City Dam Impoundment

Figure C.10

Appendix D

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #1
Looking south on Portage Creek at Allied Paper Co. (OU-1). July 11, 2001.

Photo #2
Wetland edge at OU-1 site along Portage Creek. July 9, 2001. (GPS-POR 2)

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #3
Looking south along revetment wall and Portage Creek wetlands at OU-1 site.
July 9, 2001.

Photo #4
South property line at OU-1. Portage Creek is incised and channelized.

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #5
Portage Creek at OU-1's south property line (GPS-POR 4).

Photo #6
Culvert at OU-1 south property line – Portage Creek (GPS-POR 4).

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #7
Looking north at Plainwell Dam Impoundment. July 2001.

Photo #8
Herbaceous wetland east of 12th Street Landfill site adjacent to Kalamazoo River (GPS PRL-6).

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #9
Example of gray residual soil in herbaceous wetland (GPS PRL-7).

Photo #10
Looking west from GPS (PRL-7) wetland edge located at the 12th Street location landfill.

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Kalamazoo River Wetland Delineation Study

Photo #11
Herbaceous wetland edge at GPS-PRL-6. Southwest of the 12th Street Landfill.

Photo #12
Abandoned garden site adjacent the Kalamazoo River (GPS-OCR 1). July 10, 2001.

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #13
Typical vegetation along Kalamazoo River (GPS-OCR 1).

Photo #14
Looking south at Otsego Dam Impoundment. July 10, 2001.

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Kalamazoo River Wetland Delineation Study

Photo #15
Near the confluence of Kalamazoo River and Schnable Brook (GPS-ORLS-3).

Photo #16
Wetland located between Trowbridge Dam and Otsego Dam (GPS-ORLS 3) on Kalamazoo River.

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #17
Intermittent drainage way through upland west of Schnable Brook.

Photo #18
Looking south along Kalamazoo River at Station SPMD1. July 2001.

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #19
Looking at north bank at Williams Road. July 9, 2001

Photo #20
Typical forested wetland along Kalamazoo River at Williams Road. July 10, 2001.

Appendix D
Kalamazoo River Wetland Delineation Study

Photo #21
Note stain lines on bridge supports at Williams Road. July 10, 2001.

Photo #22
Upland pine trees adjacent to Kalamazoo River (GPS-TLL 1).